INVESTIGATION OF MILITARY PUBLIC WORKS

ADDITIONAL HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

EIGHTY-SECOND CONGRESS

SECOND SESSION

SUBCOMMITTEE ON MILITARY PUBLIC WORKS

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PART 4 (Continued)

MOROCCAN AIR BASE CONSTRUCTION

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[1] Deceased, August 21, 1952.

INVESTIGATION OF MILITARY PUBLIC WORKS

WEDNESDAY, JULY 2, 1952.

MOROCCAN AIR-BASE CONSTRUCTION

WITNESSES

JOHN P. H. PERRY, DEPUTY FOR INSTALLATIONS, OFFICE, SECRETARY OF THE AIR FORCE
ARVIN E. UPTON, ESQ., ASSOCIATE GENERAL COUNSEL, DEPARTMENT OF THE AIR FORCE
COL. ADOLF KROEBER, DIRECTORATE OF INSTALLATIONS, HEADQUARTERS, UNITED STATES AIR FORCE
MAJ. GEN. GEORGE J. NOLD, DEPUTY CHIEF OF ENGINEERS
BRIG. GEN. JOHN R. HARDIN, ASSISTANT CHIEF OF ENGINEERS FOR MILITARY CONSTRUCTION
COL. GEORGE T. DERBY, FORMER DISTRICT ENGINEER, EAST ATLANTIC DISTRICT, UNITED STATES ARMY

INTRODUCTORY STATEMENT

Mr. RILEY. The committee will please be in order. We are still taking testimony on the Moroccan air-base situation, and the committee felt that the Air Force should have the opportunity of reviewing the hearings thus far held and to give their analysis and answer to the testimony which so far has been presented.

Before hearing the representative of the Air Force, I should like to make part of the record a letter of June 4, 1952, from the chairman of this subcommittee [Mr. Riley] to the Secretary of the Air Force, as well as a letter from Mr. Huggins, Assistant Secretary of the Air Force, to Mr. Riley, dated June 11, 1952.

(The letters referred to are as follow:)

JUNE 4, 1952.

Re Moroccan air-base construction.

HON. THOMAS K. FINLETTER,
Secretary of the Air Force, Washington, D. C.

MY DEAR MR. SECRETARY: The Subcommittee on Military Public Works of the House Appropriations Committee held hearings on the Moroccan air-base matter on April 9, May 12 through 16, and May 19, 1952. Notice of these hearings was given to the Air Force, and the Air Force was represented by observers throughout. So far the subcommittee has heard in full the Corps of Engineers and the Atlas Constructors, and Mr. Huggins of the Air Force briefly.

It is the purpose of this letter to formally transmit to the Air Force five copies of the page proof of the Moroccan hearings which are enclosed herewith. The subcommittee is doing this in order to afford the Air Force an opportunity to be heard, if it desires this opportunity. The subcommittee is likewise serving the page proof on the architect-engineers, with a similar invitation extended to them.

If possible, the subcommittee would like to hear from the Air Force by June 11th whether or not the Air Force desires to be heard. If it does, the subcom-

mittee requests that the Air Force list in writing the particulars on which it desires a hearing, and furnish such a list to the subcommittee, together with a statement of the pages in the page proof to which reference will be made.

The subcommittee has appreciated the cooperation and assistance extended by the Air Force during the recent hearings on military construction.

Sincerely yours,

JOHN J. RILEY,
Chairman, Subcommittee on Military Public Works.

DEPARTMENT OF THE AIR FORCE,
Washington, June 11, 1952.

Hon. JOHN J. RILEY,
Chairman, Subcommittee on Military Public Works,
House of Representatives.

DEAR MR. RILEY: This is in reply to your letter of June 4, 1952, relating to the construction of the Moroccan air bases, and addressed to the Secretary of the Air Force.

The Air Force will welcome an opportunity to give a full account of the facts that tell the story of our role in the Moroccan construction project. Many of these facts are already before your committee, but their full significance in terms of the cost and quality of the Moroccan bases has not always been fully brought out in the hearings to date. In the course of the extensive hearings on expenditures for Moroccan bases the Air Force has been charged with responsibility for various actions which it is implied resulted in excessive costs or substandard quality. Certain of these charges have been made as explicit allegations of Air Force responsibility, while others have appeared merely as implications in statements presented at the hearings. In presenting our replies to these charges we would plan to develop in some detail the evidence on the following points: (1) the urgent nature of the program, (2) relationships among the Air Force, Corps of Engineers, Atlas, and the architect-engineers, (3) site selections, (4) master planning, and (5) standards of construction. I have indicated some of the details we would plan to cover under each of these points in an appendix to this letter, and I have also cited the pages on which relevant material appears in the page proofs which you sent to us.

In making our presentation, the sole purpose will be to give a coherent and objective account of all of the Air Force actions that are relevant to the Moroccan base program. We know that this story will include some Air Force mistakes in both planning and execution, and I want to emphasize here, as I did before your committee on May 16, that we recognize and accept full responsibility for the errors that we committed. One of the principal results we would hope to achieve by a further presentation before your committee would be to put into correct perspective the relationship of the Air Force to this construction project and to assist in making an accurate assessment of the impact of Air Force actions on the cost and quality of the end product that has been purchased for the American taxpayer.

On behalf of the Air Force, I want to express our appreciation for the cooperation and assistance extended by your committee and staff during the recent hearings on Moroccan air bases. Your offer to let us elaborate the details of the Air Force story is welcomed as an opportunity to clarify a complex and confused history.

Sincerely yours,

E. V. HUGGINS,
Assistant Secretary of the Air Force.

MAJOR POINTS TO BE DEVELOPED IN THE AIR FORCE PRESENTATION

1. The urgent nature of the program and termination of the so-called "crash" program (pp. 17, 34, 36, 77, 192, 208, 307, 337).
2. Relationships among the Air Force, Corps of Engineers, Atlas, and the architect-engineers (pp. 110, 112, 120, 157, 161, 133, 322).
   (*a*) Air Force administration of Moroccan construction.
   (*b*) The Corps of Engineers as the construction "agent" of the Air Force.
   (*c*) Derby-Beadle relationship.
3. Site selections, including the circumstances causing changes in locations, abandonment of Mechra bel Ksiri, and the Mitchell-Salagar visit (pp. 9, 44, 46, 49, 53, 55).
4. Master planning (pp. 69, 84, 92, 304).
5. Standards of construction (pp. 320, 322, 338, 346).

Mr. RILEY. We are glad to have with us this morning Mr. John P. H. Perry, Deputy for Installations, Office of Secretary of the Air Force, who will make a statement on this French Moroccan air base construction situation. You may proceed, Mr. Perry.

GENERAL STATEMENT OF THE AIR FORCE

Mr. PERRY. With your permission, I would like to read a somewhat lengthy statement which has been prepared under Mr. Huggins' direction.

Mr. RILEY. Very well.

Mr. PERRY. All of us connected with the Air Force appreciate the opportunity which this committee has given us to comment on the testimony which has been presented previously on the French Moroccan air bases program. Assistant Secretary of the Air Force Huggins has asked me to express his regret that he could not be present personally to give this statement and has asked me to give it for him.

Many detailed facts have been testified to by many witnesses. We are not going to introduce any new facts into the record because we think the evidence, which has already been presented, is reasonably complete. We have no doubt that it is possible to find some conflicts as to interpretation of details among various witnesses who appear before you. I could devote my attention to an analysis of these conflicts and to a restatement of the Air Force's position regarding them. I believe, however, that it would be more helpful to this committee if I merely review what I believe are the significant facts which have been brought out, and relate those facts to Air Force actions and responsibilities.

Your concern, I am confident, can be very simply expressed: Was the Moroccan construction program a bad job? By this question, I mean to include both the factors of cost and quality of construction. If it was a bad job, who is responsible and what can be done to avoid repetition in the future?

I would like to relate the facts which have been brought out to these simple issues. I would like to examine the many unfavorable implications to the Air Force in what I believe to be the only proper perspective—as tested against actual construction deficiencies and excessive expenditures.

NATURE OF RELATIONSHIP BETWEEN AIR FORCE AND CORPS OF ENGINEERS

At the outset, I think it is extremely important that we understand the nature of the relationship between the Air Force and the Corps of Engineers. This relationship is spelled out in agreements between the Departments of the Army and the Air Force. These agreements describe the responsibilities of the corps as, first, providing technical assistance in preparation of master plans; second, execution of designs and preparation of preliminary plans outlined in specifications and cost estimates; third, administration and on-the-site supervision of the construction; and, fourth, providing the Air Force with periodic progress and fiscal reports.

The same agreements describe the responsibilities of the Air Force as, first, determination of its construction requirements and defense

of its requirements within its budget estimate; and, second, stating generally its requirements for construction in terms of space lay-out, architectural style, characteristics of operations and equipment to be accommodated, degree of permanence, and such other details as are necessary to enable the designer to proceed in accordance with Air Force qualitative and quantitative requirements.

Obviously such a relationship requires a considerable degree of cooperation. This, in turn, makes it difficult to determine, in actual cases, where the responsibility of the Corps of Engineers begins and the responsibility of the Air Force ends. I think it is evident, however, that the Air Force cannot supervise actual construction and that the Air Force must rely upon the corps for the quality of the construction and for the exercise of a sound judgment as to the cost of construction. If the Air Force attempted to supervise construction and costs on any detailed basis, it would be compelled to create an Engineer Corps of its own, thereby bringing about the very duplication which the Army-Air Force agreements were designed to avoid.

Certainly, the Air Force has the duty of providing the corps with all the information necessary to draw the plans and specifications for, and carry out, the construction set forth in Air Force construction directives. By mutual agreement, the actual preparation of master plans for the Moroccan bases was a responsibility accepted by the corps, which, in turn, contracted the work to the architect-engineers. The Air Force reserved the right to approve all master plans in order to insure that they satisfied Air Force requirements.

Perhaps I should point out here that a master plan is not a construction plan. Nothing is constructed directly from it. A master plan simply outlines in graphic, narrative, and tabular form the present composition of an installation and its projected development. Construction drawings are prepared by architect-engineers and furnished to a contractor for actual construction. The Corps of Engineers has the responsibility for approving construction drawings and specifications in the light of proposed use of the installation and the general requirements furnished by the Air Force.

The second responsibility of the Air Force was to provide the corps with necessary funds. Once funds were turned over, control of funds, including expenditures and audit, rested with the Army. The Air Force had no control over funds put in the hands of the Corps of Engineers, though the latter had the duty of providing periodic progress and fiscal reports and justification of moneys expended.

In the usual Air Force construction project difficulties and queries are referred through engineer channels to the Office of the Chief of Engineers, which resolves problems with Air Force headquarters. Obviously, however, there are a great many matters which can better be resolved informally at the scene and which do not require a time-consuming exchange of formal memoranda. For this reason a competent Air Force officer is designated to assist the district engineer and to act as local Air Force contact for the explanation of Air Force viewpoints. While this Air Force representative can and should assist the district engineer in every way possible, he possesses no command authority with relation to construction. The district engineer can incorporate or ignore suggestions he may make.

To a considerable extent, the participation of the Air Force in the Moroccan base program followed the normal relationship with the

Corps of Engineers. For example, there was no direct relationship between the Air Force and Atlas or PUSOM. Contracts with both Atlas and PUSOM were negotiated by the corps, and Atlas and PUSOM were responsible to the corps, not the Air Force, for the performance of their work. In turn, there was no direct relationship between Atlas and PUSOM. Both firms acted at the direction of the district engineer and reported to him. In brief, both planning and construction had their central points of contact in the Corps of Engineers and not in the Air Force. The district engineer alone had responsibility and authority for insisting upon or waiving specifications, for expending funds, and for directing construction. Air Force control over the corps was confined to amending construction directives or withholding funds if the situation should warrant such drastic action. In addition, the Air Force, in practice, maintained control through the Chief of Engineers over the general plan for the bases.

I think it should be pointed out, however, that in some important respects the normal relationships between the Air Force and the Engineers were not adhered to in the case of the Moroccan program because of its importance and magnitude.

RESPONSIBILITY FOR PLANNING OF PROJECTS

There was no customary sequence from master planning to construction plans and specifications and from construction plans and specifications to actual construction. The urgency of the situation in the fall of 1950 required that, insofar as possible, we proceed on all fronts simultaneously. To avoid confusion, otherwise stemming from this departure from normal procedure, the Air Force consulted frequently with the Engineers from the outset, emphasizing not only the urgency attached to the first phase of the program but also to the difficulties which could be anticipated. It was thoroughly understood that normal planning could not take place if the bases were to be brought into operational readiness in the shortest possible time. The responsibility for this decision rests with the Air Force. The risk was somewhat increased by unknown factors of a political nature which affected the program during its early stages. At the same time, however, we did not feel that the degree of risk in constructing minimum operational facilities without master plans was very great. To attempt to develop a completed base without such plans would be foolish. When the job is merely the earth-moving and concrete-laying phase of the program, a general statement of requirements tied to existing standards and manuals establishing good construction practices—the proposed use in terms of plans and personnel, the location, direction, length and width of runways, taxiways, etc., the relevant load factors—which can be readily supplemented on an orderly basis is sufficient for all practical purposes. Given such general requirements and information, the Corps of Engineers, together with the architect-engineers, can reduce such statements into readily usable plans and specifications.

During the initial phase of the program the important responsibility of the Air Force was to keep the Corps of Engineers thoroughly informed and to insure that they had all the information necessary to perform this phase. I believe that we did keep the Corps of Engineers thoroughly informed. Colonel Derby, the district engineer,

accompanied Colonel Wray on the first survey of Morocco. He worked with Colonel Wray in phasing the program. Colonel Derby also accompanied General Hamilton when he went to Morocco to commence the technical discussions in French, and he gave advice and assistance on those parts of the negotiations which involved construction. Throughout this whole period he was in a position to have completely up-to-date information on every development in the program.

There is no suggestion anywhere in the testimony that Colonel Derby was not at all times in possession of sufficient information to construct emergency facilities. There is considerable testimony to the effect that the Air Force constantly required changes in master plans. I am not convinced that we handled our obligation, in this respect, as well as we could have. But we have found nothing to indicate that our actions in this regard had any connection whatsoever with either the cost or quality of the construction. Bearing in mind what a master plan is, I think you will agree with me. Furthermore, the changes that we have required in master plans could not have affected construction, because we instructed our officer on the spot that no change in such plans was to be taken cognizance of, if it in any way involved a change in work already under way. Finally, I know of no instance in which our failure to approve master plans—or to provide construction requirements—appreciably delayed any of the work. On the contrary, we were told by Colonel Derby throughout the summer of 1951 that the full capability of the corps, Atlas, and PUSOM was absorbed by the work at Nouasseur and Sidi Slimane.

Let me emphasize that we don't wish to justify what we consider to be rather too many changes in master plans suggested by the Air Force. I think it is probable that these changes have increased the planning cost. But we don't believe they directly affected construction cost.

RESPONSIBILITY OF FUNDING

The other principal responsibility of the Air Force was to provide funds. We think the record demonstrates, despite some testimony that we were slow in this regard, that we actually supplied the funds as requested by the district engineer promptly and for the most part well in advance of his rate of expenditure. We had difficulties in this regard—difficulties which stemmed from the change in the program made necessary by the selection of new sites. More important, we had difficulties because we were never able to get from the district engineer any adquate accounting of the funds he had in hand. Apparently he takes the view that the urgency of the program and the inadequacy of his personnel prevented the type of accounting by line item normally made. I do not wish to comment on the merits of this contention, but I do wish to point out that our inability to secure the detailed cost information we wanted made it virtually impossible for us to cost the program. We had to take the requests of the district engineer on faith, and under the threat that a failure on our part to provide funds would not only delay the program but greatly increase its cost.

URGENCY OF THE PROGRAM

Now, as to the urgency of the program. As we read over the testimony before this committee, we were struck by the fact that the ur-

gency of the program has been used by virtually everyone to justify what might otherwise be considered improper practices. If a construction standard or specification was waived, it was waived because of the urgency of the program. If accounts were not kept in a businesslike manner, they were not so kept because of the urgency of the program. If adequate personnel were not available to do a workmanlike job, the job nevertheless proceeded because of the urgency of the program. If excessive overtime was paid, or if abnormal costs were allowed and approved, their justification lay in the urgency of the program.

In short, the urgency of the program has been used to justify many things which might otherwise have been subject to criticism. Since the Air Force must take responsibility for this label of extreme urgency, it has, by inference, been charged with responsibility for everything which has resulted from that label.

Now, I don't think that the argument of urgency can fairly be stretched this far. There is nothing in the record to indicate that the Air Force wanted the initial phase of the Moroccan program completed as quickly as possible, irrespective of what kind of construction we got, how usable the bases were, or how much they cost. We have standards of construction on air bases of which the Corps of Engineers were fully cognizant. There is absolutely no evidence that the Air Force executed a blanket waiver of standards or a "blank check" on expenditures. I don't believe that you will find anywhere in the record any statement by an Air Force official which can fairly be interpreted as sanctioning wasteful or inefficient methods of construction or giving approval to the use of substandard construction practices in order to complete quickly this initial phase of the program.

I do not wish to imply that this program was not considered extremely urgent. It was. Nor do I think that there is any need to justify further the extreme urgency which the Air Force attached to getting these bases built so that they could be used. All of us remember those tense days and months in the winter of 1950–51 when United Nations forces were thrown back from the Manchurian border and World War III seemed to be in the offing. No matter how urgent this or any program is labeled, however, the Air Force has every right to assume that construction will accord with sound engineering practices and criteria furnished by the Air Force. This assumption, of course, requires the exercise of a sound and broad judgment by the district engineer. In certain instances, he may feel that compliance with specifications is impractical and that nothing significant will be lost if they are modified. He would not ordinarily consult with the Air Force on such matters, since construction is his responsibility and, in the final analysis, it is he who is most familiar with the situation and most qualified to make a professional judgment. On the other hand, in the exercise of a sound judgment, he would certainly be expected to consult with the Air Force on any wide deviations from specifications. The record does not indicate that such consultations were held.

With respect to expenditures, the situation is similar but somewhat less clear-cut. The label of extreme urgency certainly justified greater than normal expenditures. The Air Force recognized in its construction directive to the Corps of Engineers—who had control over the actual expenditure of funds—that construction of the Moroc-

can bases to emergency standards on an expedited basis would be more costly than a normal program. As in the case of waiver of specifications, there was room for the exercise of reasonable judgment by the district engineer.

To summarize, the Air Force wished the Moroccan bases built to minimum operational requirements as quickly as possible. We willingly assume responsibility for labeling this program "extremely urgent." We assume responsibility for the decision to proceed with the construction of these bases without the normal period devoted to the preparation of master plans and detailed specifications. We assume responsibility for the use of a cost-plus-a-fixed-fee contract—although actual negotiations of the contract was the responsibility of the Corps of Engineers. We assume responsibility for a general awareness that construction of these bases would be more costly than a normal program. We assume responsibility, jointly with the Department of State, for the arrangements made with the French with regard to the use of Moroccan bases.

Finally, in labeling this program "extremely urgent," we assume responsibility for a rate of progress described by the Air Force Director of Installations in a letter to the Chief of Engineers, as follows:

> The objective is to meet an early ready date with a minimum of facilities.

In other words, we wanted bases to minimum operational requirements as quickly as we could get them but, I repeat, not as quickly as we could get them irrespective of their adequacy or cost.

DATE FOR COMPLETION OF PROJECT

Because there are many implications in the record that the Air Force specified a date for this construction, we would like to dwell briefly on this point.

After the initial survey, in which the district engineer participated, the program was phased for planning purposes on the assumption that the bases could be completed to minimum standards within 6 months after the date of entry into Morocco. This estimate was made by the Air Force installations people in collaboration with the Corps of Engineers, and within their views as to their capability. It was not something unilaterally imposed by the Air Force upon the Engineers.

The optimism engendered by the successful political negotiations in Paris and the agreement arrived at on December 22 led us to believe that entry into Morocco could be obtained around the 1st of January, 1951. On this assumption, a tentative completion date for the first phase of the program was set at July 1. Very soon thereafter it became obvious to all concerned that entry in any substantial numbers into Morocco would be delayed until the completion of the technical negotiations. By the middle of February it was also obvious that the program would be considerably different owing to the necessity of selecting new sites. Actually, therefore, entry of equipment into Morocco was not permitted until mid-March and the construction program did not get squarely under way until the latter part of April 1951. By that time it was a different program from the one originally contemplated.

The Air Force did not at that time modify its construction directive. There was no reason to do so, since the Engineers were just as familiar as anyone in the Air Force with the changes which had been necessitated. They knew we wanted "to meet an early ready date with a minimum amount of facilities." Not only did this concept appear in the February 1951 construction letter; it was impressed upon the district engineer many times subsequently by Air Force operations officers who emphasized the need to ready the bases as soon as possible. On the other hand, no specific date was fixed in those conversations. Neither the Air Force nor the Engineers could possibly have been in a position to fix a date on anything other than a tentative basis. What that date would be neither they nor we were in a position to state definitively.

This situation was recognized by the district engineer. He wrote a memorandum in April, which appears in the record, and which states that he is familiar with the changes in the program and which confirms that he will commence construction on those sites which had been agreed with the French. He stated at that time that he would attempt to meet a July 1 deadline on these bases. That date was not set by the Air Force. It was set by the district engineer as his own target, based upon his understanding of the Air Force's general desires for quick completion. Subsequently it became his target date for the construction of emergency facilities at only two bases, Nouasseur and Sidi Slimane.

What I wish to point out and emphasize is that the Air Force never set any date, any firm date, for the completion of the emergency phase of the program. Insofar as any tentative target dates were set, they were set either by the district engineer or with his concurrence. The only exception to this—and I don't think it really is an exception—was the completion of the runways at Nouaseur and Sidi Slimane for the Bastille Day exercise. And this date was set and this exercise planned only after the district engineer had given assurance that he would be in a position to receive planes on July 14. Presumably, this assurance was based upon the deadline which he had set for himself.

In order to meet this July 14 deadline, the district engineer and the construction people were forced to put on a tremendous amount of pressure. This "crash program" was finished when the planes landed on July 14. After that date, the program reverted to the indefinite status which it had previously held. The Corps of Engineers and Atlas had no firm ready date to meet, although the program remained "extremely urgent." The "crash program"—which has been referred to by one of the Engineer witnesses as a "super-crash" program—made necessary by the July 14 deadline, was over.

On this general question of a "crash program," I think it should be noted that we have had other crash programs, and that they have been accomplished speedily and successfully, without any impairment of the quality of the job.

The label of "extreme urgency" was not formally removed by the Air Force until January of this year. It was not then removed because we no longer wanted the remaining bases completed in a hurry. Rather, it was removed as a formal confirmation of changed world conditions which, were known to have existed for several months previously by all parties concerned.

EFFECT OF AGREEMENTS WITH THE FRENCH

I would like now to turn briefly to the effect of the agreements with the French with regard to the Moroccan program and their effect, if any, upon the cost and quality of the construction. It is true that these agreements impose certain limitations upon completely free action on our part. For example, they provide that extensive local procurement must be accomplished through French governmental agencies, and that goods must be procured locally if satisfactory with regard to quantity, quality, and price. Similarly, in general, French governmental agencies are interposed between direct relationships which the Air Force, the Engineers, and Atlas might otherwise have had with local contractors and employees.

Perhaps these requirements have resulted in increased cost. That would be difficult to estimate with certainty. But if this is true these increased costs should be regarded as necessary ones. The French Government has its responsibilities in Morocco and I do not believe that any of the agreements impose unreasonable obligations upon the United States. As the record makes obvious, the principal difficulty encountered during negotiations with the French was the location of the bases. When the French became aware of the number of personnel we contemplated putting on the bases, they insisted upon the selection of bases removed from centers of population. To agree upon satisfactory sites, which were so removed, proved extremely difficult and delayed initiation of the program almost 4 months. When sites were finally agreed upon the program proved to be a different one in terms of its scope than that originally contemplated.

SELECTION OF SITES

The selection of satisfactory sites was from the United States point of view a responsibility of the Air Force. Despite the urgency of the program we were unwilling to agree to locations which we believed operationally unsatisfactory, even though it became evident that our failure to accept sites proposed by the French would delay the whole program. This delay may have resulted in increased pressure upon the engineers and Atlas when construction actually got underway in mid-April, but it would not otherwise affect adversely construction costs. In point of fact, it permitted Atlas additional time to stockpile supplies and construction equipment and as a result of the decision to proceed initially with only two bases, to concentrate their production capacity. The engineers themselves have described the delays and difficulties as a "blessing in disguise."

I would like to state here that the decision to abandon construction at Mechra bel Ksiri was a decision for which the Air Force assumes full responsibility. The direct cost of this abandoned construction—estimated at about $126,000—must be assessed to Air Force misjudgments.

I do not think it would be profitable to review in any further detail the evidence before this committee. But I would like to summarize our views on the program as a whole.

First and foremost, I think it is obvious that this whole program could have been successfully carried out only with the closest cooperation and teamwork among all those involved. The complexities of

the program, its urgency, and the fact that it proceeded without the normal period in which plans mature and can be reviewed, all necessitated the closest of relationships. As this committee is aware that relationship did not exist despite some surface indications to the contrary. I do not wish to engage here in personalities in this regard. I merely wish to say that I believe responsibility for a failure to achieve the cooperation so absolutely necessary is one which must be borne by all the parties concerned—by the Air Force, the Engineers, Atlas, and PUSOM.

The Air Force believes that the situation in Morocco has now been remedied and that the cooperation necessary to the successful completion of the program exists. There is in the record letters from Assistant Secretary Huggins of the Air Force, and Secretary Pace, of the Army, which detail the steps which have been taken to insure that the program will proceed—and has proceeded since February in an orderly and economic manner.

EXISTENCE OF CONSTRUCTION DEFICIENCIES

Finally, I think this committee should keep in mind that such construction deficiencies as exist are present only on two bases out of a total of five, and that even these bases have only been completed very partially. In other words, it would not be fair to conclude that the entire Moroccan air-base program was a badly done job. Only a part of that job has actually been completed, and the reported deficiencies are only in portions of that part. We have every reason to believe that the remainder will be constructed efficiently and economically.

Thank you, sir.

Mr. RILEY. Thank you, Mr. Perry. How long have you been deputy for installations?

Mr. PERRY. Since January 11, 1952.

Mr. RILEY. You were not in on the original program, then?

Mr. PERRY. No, sir.

Mr. RILEY. Are you an engineer, sir?

Mr. PERRY. I am a licensed professional engineer in the State of New York and am a graduate engineer; but I have been a building contractor for 45 years. Whether you call those fellows engineers or not I do not know.

Mr. RILEY. I will agree with you that experience is the best teacher.

Mr. PERRY. I suppose, answering the question, I would qualify as an engineer.

Mr. RILEY. I note here that all through your statement it seems to be the opinion of the Air Force—maybe I am wrong—that there was a deficiency in the construction, or the early construction, at least, at Nouasseur and Sidi Slimane. Do I interpret this correctly?

Mr. PERRY. I think that is a fair interpretation.

Mr. RILEY. Would you mind noting some of the deficiencies which you consider existed at those two bases?

Mr. PERRY. Might I approach it on a somewhat broader angle?

Mr. RILEY. Yes, sir.

Mr. PERRY. And cover the deficiencies in my stride, so to speak.

Mr. RILEY. The committee, I want to assure you, feels that it is open-minded. Certainly that is the intention of the committee. We

want full opinions from all parties concerned; and then the committee is going to make up its own mind.

Mr. PERRY. Mr. Huggins asked me, if you were agreeable, to give my impressions.

Mr. RILEY. Yes, sir.

Mr. PERRY. After a life spent in the construction industry.

I think my study of this job since January 11, sort of boils down to four or five very strong impressions which I have of the work.

INSPECTION OF THE PROJECTS

I went over there at Mr. Huggins' request about January 22 or 23, 1952, and I spent some 4 or 5 days there looking over Nouasseur, Sidi Slimane, and Ben Guerir.

I went over in the plane with General Pick, General Nold, General Hardin, and others of the top ranks of the Engineer Corps. I stayed on. They went on further and then came back in February. Mr. Huggins came about 5 days after I was there.

We had a meeting with Colonel Derby and with our own people. Then I went back again, with Mr. Huggins, at the end of April. There was a 3-month lapse in time. I spent 2½ days there the second time.

In the meantime I had read, I guess, everything in print on this job. I had read all the testimony before the Lyndon Johnson committee. I had studied the reports of Griffiths and Wise and Weiner. I had interviewed both Griffiths and Wise. I had never met Weiner.

I followed the testimony before your committee.

I was in Mr. Alexander's office when, following the request from the Air Force, the Army made some changes in French Morocco. I heard the initial meeting between Mr. Alexander and some of the other Army representatives and Atlas. I was at the meeting some 2 weeks later, I think it was, in February or early March, where Atlas and later PUSOM made their reply to Mr. Alexander's request for, you might say, explanations of what had gone on in French Morocco.

Out of those contacts I have certain judgments or beliefs.

Now, first, I would like to make clear that I have no animosity in this thing. As a matter of fact, the leading contractor, Morrison-Knudsen, was a partner of my old company, of which I am still a director, though not active, having retired, on probably the greatest construction job in World War II. We then built in the Pacific in an area three times the size of the continental United States, some $350 million worth, at those prices, of the fleet air bases, from Midway, Wake, Guam, and so on, clear across to Cavite and down to Samoa.

Then they continued with something like a billion-dollar procurement for the Navy for the Seabees.

Morrison-Knudsen was one of our top groups. I have always looked upon them as one of the leading contractors in the heavy game in America.

Similarly, Bates & Rogers, perhaps the second one so far as size and national reputation goes, in the Atlas Corp., is of unquestioned reputation, to such an extent that my old company has a very big job now in Michigan, opening some copper mines, and is giving Bates & Rogers some very large subcontracting on the grading.

So two out of the five I knew well and have been associated with. They are business friends. I would not say they are personal friends.

I want to set that up as making it very difficult for me to say what I am about to say, with no thought of any personal animosity.

RELATIONSHIPS AMONG AIR FORCE, CORPS OF ENGINEERS, ATLAS, AND PUSOM

When I got over there I was disturbed to find what I thought and still think was an unhappy job. For anybody who has been in the construction game for years, the first thing he wants to know is: "Is it a happy job or is it an unhappy job?" If it is an unhappy job it is a sick job.

When I got over there, obviously, to use a West Virginia expression, they were fighting and feuding. It may be a South Carolina expression; I do not know.

There was a bad relationship, from my point of view, between the Corps of Engineers and PUSOM. There was definitely a bad relationship between the Corps of Engineers and our own representatives of the Air Force, the local representatives. There was not a very happy relationship between Atlas and PUSOM.

A good deal of this has been brought out in the testimony before Senator Lyndon Johnson, and before the Hardy committee.

I got there on a Tuesday night, I guess, and arranged to hold a big meeting at which I asked the engineers not to be represented, because I wanted to be able to talk to the contractors and the architects with my hair down, as an old contractor. I had, I suppose, 25 or 30 men in the room.

It was not a happy meeting. The architects were trying to put the ball in the contractor's lap, and vice versa. There were some pretty harsh statements made.

Later on I talked to Colonel Derby, and his comments on PUSOM were not happy ones. So the job was an unhappy job. There was very little team play.

These are my judgments. None of this is provable, but Mr. Huggins asked me to give you these judgments.

As we point out in this statement I have read, if this job was going to be a good job it had to have team play of the first water. It has it now, we are pretty well convinced. Certainly last January and last April it did not have it, and it was obvious it had not had it through the fall. That was one thing which impressed me: That it was an unhappy job.

EFFECT OF INDIFFERENCE TO COST CONTROL

Then I think one of the most outstanding reactions that I got was the effect of the indifference to cost, the indifference to cost control.

I spent 45 years building buildings, and my old company has done something of over a billion dollars worth of work and has built probably over 2,500 buildings. Cost is the essence of contracting. Sound estimating and particularly cost control are important.

By "cost control" I am not merely referring to what you work out as your cost several months later, but I mean you have to know it when the costs are being made and you have to have a system so that

you can project those costs into the future. The time to get costs is when they are being made, so you can make changes.

I said to some of the Morrison-Knudson representatives that I was shocked at that great company and their associates, who make up the others, and I asked: "Can you not give me any costs?" They had spent 140 million dollars.

In that big meeting, Mr. Kalette, who was Mr. Pace's adviser, somewhat similar to myself, demanded—I think that is the right word—of Atlas that they come up with something on cost by January 31. This was January 25 or 26.

We got them. There were $59 million of undistributed costs. That is to me something which just does not make sense.

Two or 3 months later, under pressure, the Corps of Engineers was able to get out some statements from Atlas, and as I remember it there was $91 million of undistributed costs.

I urged in the meeting in Mr. Pace's office that no work be started from then on until the costs had been determined and estimates made on the basis of those costs, and some attempt to forecast costs which prevailed. I say it is incredible to me that that distinguished group of contractors could have run that job for a year without being more cost conscious than they were. I could develop this a great deal further, but I will not.

WEAKNESS IN CONTRACTORS' ORGANIZATION AT PROJECT

Now, I was also disturbed because it seemed evident to me—again, I cannot prove this, and it will probably be denied vigorously—that when this job started this group of contractors certainly did not have the first team out on the field. It has been said in many discussions, and from the checks made, with some little knowledge which I have, that it was the third or fourth team that started that game. It was not until things began to get into difficulty that some of the top brass of the various companies began to devote time to it.

To me, with fairly wide experience, the job is not a happy job when you have to change horses two or three times. Mr. Wilbur is there now. He came in in January. He is the third No. 1 man that came there. Dan Teters was in between, and Borman started.

In my experience something is not quite right when you have to change commanding officers three times in a year.

Similarly, at Nouasseur, I understand, there were six different superintendents on that job by the time I got there. That is not right.

I was disturbed by the testimony Mr. Bonny, the executive head of this group, used to paint the picture of the strengthening of the organization. In February, I think it was, they strengthened it by getting Mr. Shriber, or Shrier, or some such name, to be administrative officer. He did not come from one of the five companies. They had to go outside and find the man to help straighten out that job. That does not sound good to me.

DISCUSSION OF LACK OF SPECIFICATIONS

So much for the contractors' side. I was startled by the testimony before your committee, I think, and the Lyndon Johnson committee,

that there were no specifications. That is a lot of rot to me. Certainly that is a strong word, but I use it advisedly.

Certainly there is a manual of construction which the Engineers use. The Air Force has manuals. These contractors were picked because they were outstanding. At least two of them were. Those fellows all knew what good construction was. The specifications may not have been on paper, but this alibi that, "We did this without specifications," does not set with me at all.

I was disturbed—on this I want to look over some notes I made—on one other point, which I want to make. I was greatly disturbed, and I am not sure that this angle has been cleared up yet. When the Atlas Contractors, through largely Mr. Bonny and Mr. Wilbur, repeatedly passed the buck to the Corps of Engineers: "We only did what the Corps of Engineers told us to do." To me that is heresy. Good contractors who are in this country are hired by the greatest industrial corporations in America and the great banking institutions primarily because of their knowledge, reputation, and know-how, to check on the architect-engineers. To say: "We have no responsibility. We will build anything the Army engineers tell us to," is not cricket in my book. I think it is heresy.

Finally, as to the future, I think we have a team working there now. I think General Walsh and Colonel Campbell have the car back on the track. I think the policy of General Walsh of making Atlas subcontract as much of their work on a fixed-price basis as they can, is sound.

I get reports from General Old pretty regularly. They are quite optimistic and glowing.

QUALITY OF WORK

Finally, I would like to say that I think the sickness of the Moroccan job is immensely exaggerated, somewhat like Mark Twain's account of his death.

Here is $400 million or $450 million or more on a job, with perhaps $250 million obligated at this time. Two bases out of the five are started. You have had some deficiencies in the aprons at Nouasseur and the taxiways and the aprons, and I believe now on the runways at Sidi Slimane, but what are they against the whole show, and what are they going to be against the whole show when it is done 2 years from now? They are minor. All the charges of venality and false bookkeeping and some of the silly things that have been said about some of these offices are just pin pricks. They mean nothing.

The job is not a bad job. It was sick, but I think it is being cured.

Thank you, sir.

Mr. RILEY. Mr. Perry, I have just one or two questions I would like to ask.

TESTS BEING MADE OF RUNWAYS

Have you made, or through your office have there been made, any borings or examination of the runways, which would lead you to believe that they are unusable?

Mr. PERRY. No. That is all being done.

I think, from what I saw over there at the end of April, and from what I have heard since, it is being admirably done by the Corps of

Engineers. We were told, I think, that there were 455 borings made at Sidi Slimane. I think they are complete. Out of those borings will come a judgment.

There are few people or organizations which are better equipped than the Corps of Engineers, with their Vicksburg Laboratory, to evaluate how to cure a piece of bad pavement at Sidi Slimane.

There is not any question about their being some trouble there. I am not a pavement man. I am just a bricklayer; a builder, if you please.

Mr. RILEY. I was just wondering whether or not you had had any information with respect to that investigation.

Mr. PERRY. I was there, as I say, and spent a day at Sidi Slimane. I looked at some of the tests. Some of the readings certainly indicated that the workmanship was not up to standard. The reasons for it not being up to standard have all been brought out before.

PROBLEM OF DRAINAGE

Mr. RILEY. We had some testimony here that a part of the trouble, at least, was a lack of drainage.

Mr. PERRY. Yes.

Mr. RILEY. And that they had had some difficulty in getting rights-of-way from the French in order to construct the proper drainage.

Mr. PERRY. I think I could save your time if I would say this: I read the testimony before your committee. I think it is not too wide of the mark. I think it indicates that the Corps of Engineers is certainly going to do something to put that pavement back.

It is a difficult judgment to make, I believe. Drainage was undoubtedly part of the problem there. But the Air Force is not making any borings. We are not trying to make any. The Corps of Engineers is our construction agency on that job.

Mr. RILEY. Now, Mr. Perry, I believe you told me you came on the job in January of this year.

Mr. PERRY. About January 25, I think.

Mr. RILEY. Which is a considerable length of time since this "sick program," as you term it, had been in existence. So you have had to evaluate these things from the information which you received and the experience which you have had, which has been a very wide experience.

QUESTION AS TO ATTEMPT BY AIR FORCE TO IMPOSE ENGINEERING SUGGESTIONS UPON THE ENGINEERS OR CONTRACTORS

But you do know of your own knowledge or from the studies you have made whether or not there was any attempt on the part of the Air Force to impose engineering suggestions on either the Engineers or the contractors?

Mr. PERRY. I am ignorant of any such thing, except as we dictate the lay-out on master plans. That is our job. We have given it to them, and they have given it to PUSOM, to whom they subcontracted all the architect-engineering work, including inspections.

I am not aware of, nor have I heard of or seen, any reference that we have attempted to tell them the thickness of pavements or the engineering details. The master planning is all.

It may have been done. So much has gone on I cannot say.

Mr. RILEY. My recollection may be faulty, but I believe that in the testimony there is some evidence that there was some inclination, at least, on the part of some of the Air Force officers to make engineering suggestions.

Mr. PERRY. I cannot buy that, to use a slang phrase. I am just not conscious of it, sir. I cannot say it is not so, but I am not conscious of it.

Mr. RILEY. I am just trying to arrive at the facts.

Mr. PERRY. So far as I know, it is out of routine with the picture.

DIFFICULTY OF ARRIVING AT PROPER COST DISTRIBUTION

Mr. RILEY. There was some testimony here that the reason that they could not arrive at a proper cost was that a great deal of the material and a great deal of the equipment which was there was purchased for the purpose of operating on five bases.

Mr. PERRY. Yes.

Mr. RILEY. Of course, that cost had to be distributed among those five bases.

Mr. PERRY. Yes.

Mr. RILEY. In this crash program or urgency program, the major part of the construction, at least, was for these two runways and aprons at Sidi Slimane and Nouasseur.

Mr. PERRY. Yes.

Mr. RILEY. That, of course, imposed some difficulty, in getting that cost distribution. Would you care to comment on that?

Mr. PERRY. I think that is obvious. They got the costing the first week in January. They were told to get the plant regardless, so to speak. That was sound. They were told to get the materials.

They built up a tremendous stockpile of construction equipment. I think it runs $30 million, all told, for the construction equipment.

For myself, I do not know. I suppose the procurement has been $40 million-some-or-more by now.

To form a sound, accurate accounting or audit viewpoint, and to make a mathematical distribution of that—call it $75 million—to two bases which are underway, and three which will be built, is very, very difficult. Well, it is impossible.

But from a contractor's point of view you would take the work you have got, and you would just prorate it, so that you get some sort of a general figure, and then you would readjust as you pulled materials out of that stockpile for this base or for that base.

When we got over there, to me it was a total lack of cost consciousness on that job. Maybe it had to be, but——

Mr. RILEY. But that would constitute one cause for delay. I do not mean that they should not have had these costs.

Mr. PERRY. Not for delay. It might make it difficult to get accurate costs. But you should try to get as much cost out of the picture as you could.

Mr. RILEY. Well, it is easier, of course, to put your finger on mistakes after they have happened.

Mr. PERRY. Right.

Mr. RILEY. Easier than it is at the time they are happening.

Mr. PERRY. Yes, sir.

COSTS DUE TO DELAY IN FUNDING

Mr. RILEY. In your study of the situation did you find any evidence that the delays in funding created additional costs?

Mr. PERRY. No, I do not think so. It might have been minor. You might have had your procurement stop once or twice. You had some orders canceled. I do not think that occasioned a delay. It may have increased costs somewhat. I have no data on that personally, sir.

Mr. RILEY. Would that not constitute, though, a weakening of morale?

Mr. PERRY. It might.

Mr. RILEY. To be always on your toes, wondering as to whether or not you were going to be paid?

Mr. PERRY. You know, if a contractor does not have trouble, it is like the fleas on a dog. It makes him realize he is a dog. A contractor gets a good many things that are all in a day's work. If I were arguing the other side of the table, you might put up a picture on that, but I think this job has been exaggerated. It is not a very difficult job. There are no great dams nor tunnels or things to be built. It is a straight paving job and is a routine straight building job. It runs to large quantities, but there were far bigger things done in World War II, and far more difficult things done in World War II.

USE OF LOCAL MATERIALS

Mr. RILEY. Would there be any criticism on your part as to the fact that the Engineers and the contractors used the local materials available instead of trying to ship them in?

Mr. PERRY. I know that story. I have read it all. It may be that that decision had to be made, but I cannot understand why they let months go by, and did not get the right kind of rock crushers, when they had the rock to use and when they had carte blanche. It may be the pressure—Colonel Derby called it the super crash program, Bastille Day—to get some pavement down.

When I first went over there I did not quarrel so much with that. It was not, as Senator Hunt said, any 2 months' job. They got going in January. They had from January to April 23 to assemble the men, to build their organization and to get to work. They had the equipment over there in March.

When they got the green light on the 23d of April they had the runways in 83 days. That was a very good job. Maybe some quality had to be sacrificed, but after that I cannot see it.

EXTENT OF DEFECTS AT NOUASSEUR AND SIDI SLIMANE

Mr. RILEY. Well, that is the main point at question, is it not, as to these two runways?

Mr. PERRY. At Sidi Slimane I think they are going to have some trouble.

Mr. RILEY. There has not been too much criticism over the program since July 14, 1951, has there?

Mr. PERRY. At Nouasseur the only trouble I am conscious of is the apron. If a fellow walks over that job or drives over it, you cannot

know, really, until you get the sort of tests that have been made necessary at Sidi Slimane.

Mr. RILEY. It is not too evident?

Mr. PERRY. Where you can see an alligator surface, where some of the clay has been washed off the aggregate, the aggregate was a little bit dirty. I would rather leave it to the Corps of Engineers, who certainly know more about asphaltic pavements than any other group I know of in America.

It is a lot like General Pick said: "Leave it to the corps and we will make it right."

I think that is the history of the corps, and I think they will do it. We have all stubbed our toes at some time in our lives. They got their feet wet a little last summer, and they are certainly swimming for shore right now; and I think it is all right.

Mr. RILEY. We would not be human if we did not err sometime, would we?

Mr. PERRY. The Corps of Engineers is, we think, well qualified. I may be shot when I get out of here, but we are all good friends.

Mr. RILEY. I may be shot with you.

In your opinion and out of your experience, it is not possible just to go in and take a visual examination of those runways and say whether or not they are of good construction?

Mr. PERRY. No, sir. Any man who does that is crazy, in my judgment.

Mr. RILEY. Off the record.

(Discussion off the record.)

Mr. RILEY. Mr. Davis, do you have any questions?

QUESTION AS TO END OF DEADLINE DATE

Mr. DAVIS. Mr. Perry, there were a few things in your statement which just do not square with my recollection of some of these things that we have been talking about for several weeks.

One of them is the statement that the July 1 date was never used as a deadline date. Now, we had not once but several times the mention of that July 1 date as being the deadline date that they were shooting at.

Mr. PERRY. I think the explanation given in that statement that I read makes more sense than anything else I have heard. As I understand it, General Pick called Harry Morrison in at the end of December, or January, and said: "We got to get something going in 6 months, and we are off."

We assumed you could get right into Morocco and there would be no trouble. The contract, as I understand it, was written that the first phase had to be done 6 months from the date of access. The date of access did not come along for the construction equipment, I believe, until the late part or the middle of March. Technically it should have been in December.

But actually they got going the 3d of January. Six months was the 1st of July. We can find nothing—and we have searched the records up hill and down dale in the Air Force—that would controvert that statement. That is final, so far as we can find it.

Mr. UPTON. Mr. Davis, if I may supplement what Mr. Perry has said on that, my recollection is that the July 1 deadline was derived

in about two steps from the Wray report, which preceded the actual construction directive of the Corps of Engineers, and which I believe did speak of a 6 months' construction period after entry in Morocco, on the theory outstanding at the time of the Wray report that we would be able actually to start in Morocco around the first of the year. That would have carried it up to July 1.

Then, of course, after the Wray report, as you know, we were not able to get entry until April. That is my impression of how the July 1 date originated.

Mr. PERRY. Mr. Upton has had a good deal to do with the drawing of this statement, Mr. Davis. It is a joint statement. I read it as "I" because of the way the thing is written, but I do not claim to be the sole source. It is a statement of the Air Force position, that those of us who are familiar with this thing, think is sound.

Mr. DAVIS. It seems to me that there was probably the same kind of misunderstanding here as with respect to the ending date of the crash program. I do not think there can be much question that at least the engineers had a very widespread impression throughout their organization that the Air Force expected them to get something done by the 1st of July.

This statement you have presented, Mr. Perry, says that the crash program was finished when the planes landed July 14, but you did not tell the engineers that.

Mr. PERRY. There was a letter from Colonel Derby dated December 13, 1951, saying that the crash program would be over on Bastille Day, and his later testimony was that that was a "super" crash program; that the whole thing was a supercrash program. The result is that you get lost in a forest of words. It was common knowledge on that job that once you flew those bombers on Bastille Day you could go along on a normal basis. The reason for the letter in January was to clear the technical record.

Mr. DAVIS. You mentioned in your statement: "Unknown factors of a political nature." Were you referring there to the difficulties involved in getting the bases, and so on, from the French Government?

Mr. PERRY. Yes.

Mr. UPTON. That is what that is intended to refer to, the negotiations with the French.

EFFECT OF CHANGES IN PLANS

Mr. DAVIS. There is a statement in here that I would like to ask you to refer to, appearing on page 6, where, after mentioning the changes in plans, this statement is made:

> But we have found nothing to indicate that our actions in this regard had any connection whatsoever with either the cost or the quality of the construction.

Mr. PERRY. I think we go on and say that it did affect the cost of the plans. I think that is a sound statement. I read that with great care. It is a fact.

Mr. DAVIS. It will always be a question, I suppose, as to whose nest some of these things are coming to roost in. Certainly it would

seem to me that the mobilization and demobilization of some of these construction forces——

Mr. PERRY. I think that you may be a little bit confused there. We talk of the master plans there. We are not talking of the moving of the base sites back and forth. If you will read that paragraph, it is limited to changes in the master plan.

Mr. UPTON. That is right.

Mr. DAVIS. But the changes in the master plans themselves did so interfere with the activities of the engineers and the contractors——

Mr. PERRY. I think we make the point that the cost of the plans by PUSOM may have been kicked up a bit. The whole expenditure might not have been over 2 percent of the cost of the job.

Mr. DAVIS. I do not believe that the record will dispute that the changes in master plans insofar as they affected the activities of the constructors, as well as the engineers, did have an effect on the cost.

Mr. PERRY. Are you talking about the master plans, or the switching of one base to another? That is a different thing. I followed that master plan since I have been in the show, and I resent changes perhaps more than anyone in the Air Force.

Mr. DAVIS. Changes in master plans is what this refers to.

Mr. PERRY. I do not think that you can controvert that statement, sir.

Mr. DAVIS. I think that most of the other questions that I would have with respect to this statement will be answered by a comparison of the statement with the record of the hearings that we have made. I do not believe that I will ask Mr. Perry anything further.

Mr. RILEY. Mr. Donnelly has one or two questions.

EXTENT OF DEFECTS IN NOUASSEUR AND SIDI SLIMANE PROJECTS

Mr. DONNELLY. Mr. Perry, I would like to show you a map that was printed in the hearings at pages 171 and 172, a map of the runways, taxiways, and aprons at Nouasseur and Sidi Slimane, and you will notice on the map that the area of defective pavement is indicated for both of those bases.

Now, with respect to Nouasseur, which is the portion of the map at the top of the page, you will see that the area of defective pavement is limited to five spots on the operations apron.

Mr. PORRY. Yes.

Mr. DONNELLY. The testimony in the record is that defects were not discovered or detected or experienced at any other location at Nouasseur except those five relatively minor points. Do you concur in that?

Mr. PERRY. I have no data to contradict that statement. These were the break-through points under the 200-ton roller?

Mr. DONNELLY. Yes.

Mr. PERRY. There is some question of low spots and sharp grades on the taxiway, but to my knowledge—and I have only been there twice, and from what I know is from reading the testimony——

Mr. DONNELLY. At the bottom portion of the map the runways, the taxiways and the aprons at Sidi Slimane are shown, and you will see in the taxiway paralleling the main runway five spots which the

record shows have an alligatory surfacing of the asphaltic surface for a distance of approximately 2,000 feet. The record further shows that that limited area of 2,000 feet is the only place in Sidi Slimane where failures of any kind or character have been detected. Do you concur in that?

Mr. PERRY. I would not concur in that from what I saw.

Mr. DONNELLY. To what extent would you say there had been failures or defects at Sidi Slimane in addition to the area on the taxiways?

Mr. PERRY. The day that I was there we walked over that area with two new recent Engineer officers. I have forgotten their names, but they were both lieutenant colonels, they were recalls and very fine men, and I think the statement was made that there were over 4,000 feet that was defective instead of the 2,200. Certainly I saw more than 2,200 feet at the west end. Just how much I could not say.

Mr. DONNELLY. The west end of what? The runway or the taxiway?

Mr. PERRY. A taxiway, and I saw difficulties on the refueling aprons and at the end. In other words, if these five circles here indicate the only points of defect that were at Sidi Slimane, I think that gives an erroneous impression. I cannot put on the map the areas that I saw.

Mr. DONNELLY. This is quite an important matter. I would think that the Air Force at this point, having availed itself of the invitation of the committee to be heard on this problem so that the record would be complete, would want to furnish data on that showing what the Air Force believed to be the area of failure and defects.

Mr. PERRY. If you want it we will try to get it for you. I would like to introduce this thought: From the day that Mr. Huggins and I were there in January, and again in April—and he is going back week after next—we tried earnestly to leave this with the Corps of Engineers, our construction agency. We have a good deal of faith in them and they are the ones who furnish these records. We have no means, without making a special job of it, of measuring the defective work. The way we get it, we ask the corps for it. We get it from what their records show.

Mr. DONNELLY. The corps furnished this map. The great difficulty, Mr. Perry, is that there has been created a widespread impression that the Corps of Engineers construction on these two bases was defective to a considerable degree.

Mr. PERRY. I think "considerable degree" is too strong a language. I tried to wind up my statement by saying the deficiencies are relatively small, in my judgment, considering the amount of money spent. I think that there would be more defective area than is shown here for Sidi Slimane. I think the map for Nouasseur gives a pretty good picture as it is now. No man could say what it will be a few years from now. There could be difficulty with the subbases because of the nature of the asphaltic concrete, and there could be high maintenance cost a year or two from now. I am speaking only of the current situation.

QUESTION AS TO WAIVER OF CONSTRUCTION SPECIFICATIONS

Mr. DONNELLY. Now, I gather the impression from your statement, Mr. Perry, that there had been a waiver of construction specifications by the Corps of Engineers and the contractor in doing the construction.

Now, the record here, I do not think will bear out that there was any waiver, or ignoring of specifications.

Mr. PERRY. I read all that testimony and I do not buy a great deal of it. I think that there is work not up to ordinary specifications for this kind of pavement. As I said several times, and in the Lyndon Johnson committee, I am not a pavement man and I do not pose as an expert, but certainly I am influenced from what I have read and saw over there that there was some deviation from accepted standards of good workmanship. Perhaps it was necessary in the judgment of the Corps of Engineers. They were our agency, but there is a great deal of belief that the workmanship that was done is going to result in some high maintenance costs.

Mr. DONNELLY. That, of course, is a matter of opinion.

Mr. PERRY. That is what I am saying.

Mr. DONNELLY. I just want to clear up this one thing—I would like to get for the record here, if we may, the basis for the statement that you made that there was a waiver of specifications. Now, in order to reach that, I suppose we would have to find out first—and I think the record will show—if there were specifications.

Mr. PERRY. I think so. I think if you will read from the Griffith report and the PUSOM correspondence, running through October, November, and December, you will find a great difference of opinion between PUSOM, who were the creatures of the Engineer Corps, hired by the Corps of Engineers, picked out by them—I think that you will find they quarreled greatly with the character of workmanship. They just did not think it was the right kind of work. I think that Sidi Slimane is beginning to show up some of that in the taxiways.

TARGET DATE FOR ENDING URGENT CONSTRUCTION PROGRAM

Mr. DONNELLY. You devoted in your prepared statement a considerable bit of attention to the matter of the target date for the completion of the urgent program in construction. In your prepared statement you indicate that the Air Force does not know where the date of July 1 came from. You indicated later, from your colloquy with Mr. Davis, that the Air Force had searched its records and had not found any document.

We have here in the record at pages 309 and 310 a memorandum signed under date of January 10, 1951, by Maj. Gen. Patrick W. Timberlake, Director of Installations, Office, Deputy Chief of Staff Matériel, and in this document the completion date is described as the ready date, and the footnote says, "Ready date means 'date when base is ready to set up its assigned mission'."

With respect to Morocco, we have for the bases different names than the ultimate names with the sole exception of Nouassuer, but with respect to five of the six bases in this list of General Timberlake's, the ready date is specified as July 1, 1951.

Mr. PERRY. I would not be conscious of that letter. There was a letter that we heard about being written by General Timberlake in the spring, but we could not find it. I do not recognize this letter of January 10 at all.

Mr. DONNELLY. Throughout this committee's hearings on Morocco representatives of the Air Force have attended as observers, and in addition the committee furnished to Secretary Finletter a page proof of this testimony, which includes this very letter.

Mr. PERRY. I think that I have read most of the page proof, and I just plainly muffed this one; that is all.

Mr. DONNELLY. Another matter that has caused the committee some deep concern is the question of the release of funds.

Mr. PERRY. I am going to ask you to excuse me from that because I have no personal knowledge of it. I could get the fellow from the Air Force to come up here, who has handled that.

EFFECT OF DELAYS IN FUNDING PROJECT

Mr. DONNELLY. As a construction expert—and you are that—I would like to show you this map, or this chart, which is printed in the hearings at page 572. This shows the appropriations by the Congress of money for the Moroccan project, and apportionments made of funds.

We have shown here a line of obligations, obligations meaning the obligations by the contractors for the necessary materials, equipment, and personnel. If you will look here, you will find that the obligation line to the end of July 1951 has actually exceeded the money appropriated by Congress and the money apportioned, and that situation continued on, as you can see here, clearly on the chart, for a period of months up until the end of October 1951. That is when the Congress appropriated an additional $178 million.

You also see in the month of November the obligation line exceeding, as it had continually, the apportionment line, though there was no money, and the testimony in the record has been that they were operating on very close finances over a period of many months.

Mr. PERRY. I am familiar with that.

Mr. DONNELLY. Now, you find in November 1951, that there was apportioned only $100,000,000 out of the $178,000,000 that Congress appropriated, and that the obligation lines met that additional $100,000,000 immediately, so again the contractors and the Engineers were over there in Morocco without money, actually operating with less money than they needed.

Now, in view of this situation, we have testimony that the job was drastically curtailed and almost shut down four times.

Mr. PERRY. That is right.

Mr. DONNELLY. And this is relevant to your statement with respect to delays and cost of construction. As an expert in this field, would you not agree that when the Corps of Engineers and the constructors had the job to do, a very urgent job, they were seriously retarded and the thing was made more expensive by this lack of funding?

Mr. PERRY. That might be, sir. I have never seen that particular chart. It is no doubt disturbing to a job not to know whether you

are going to get paid or not, but I do not understand that the work was ever stopped. Some procurement was stopped at one time.

Mr. DONNELLY. The procurement pipeline.

Mr. PERRY. Well, the procurement was stopped, and in view of the fact that they had such an enormous stockpile, buying for five bases through January, February, and March, and the decision then to really build only two bases instead of five, the fact that your procurement stopped I do not think hurt the job. That is what I am trying to say. It might have hurt if all five bases were rolling and 2 months later you had an empty space in your pipeline, but I think that you had enough reserve to carry over any such gap of that type.

EFFECT OF CHANGES IN PLANS

Mr. DONNELLY. On page 4 of your prepared statement you say this:

> Air Force control over the corps was confined to amending construction directives or withholding funds if the situation should warrant such drastic action.

By amending construction directives there, do you mean changes in master plans?

Mr. PERRY. I think so; yes.

Mr. DONNELLY. I have here the master plans for these bases, and we have the first master plan for Sidi Slimane of May 28, 1951. That was subsequently changed by preliminary section stage by the Air Force, with no date on it, and then we have the next one which is preliminary second stage B, July 3, 1951, and then we have the second stage master plan, July 6, 1951, and then we have the third stage master plan, November 28, 1951, and then we have the third stage master plan, January 27, 1952, and then we have the preliminary third master plan approved by the Air Force on March 3, 1952, and the fourth stage master plan approved by the Air Force on March 18, 1952.

Now, in the light of this constant vacillation and change imposed by the Air Force on the Corps of Engineers, would it be your judgment and opinion that this had a drastic effect upon the construction operation?

Mr. PERRY. No, because we try to make the point that none of these—you might call them editions of the master plan—affected any work that had been done. A lot of this was planning way into the future, and it was studied and restudied and did not affect the work in the field, as I understand it. When I was at Sidi Slimane two different times talking to the officers they had no complaint, that I can recall, that the change in the master plan interfered with the orderly progress of the work at that time. I can see what you are driving at here; it looks as though we were vacillating, but a lot of those were studies.

Mr. DONNELLY. The testimony has been there was no lead time for planning and that the Air Force in its original directive prescribed that planning and construction proceed concurrently.

Mr. PERRY. To get going with the runways and the POL, and the hangars and the houses and recreation.

Mr. UPTON. We wanted the minimum operational facilities there.

Mr. DONNELLY. In the case of Nouasseur the same situation obtained with constant changes in the master plan.

Mr. PERRY. It is not only a base but a tremendous depot designed to serve ultimately four or five bases. That is a big show—Nouasseur. There were many studies of how to do it.

Mr. UPTON. May I interrupt your trend of thought to return to the July 1 deadline question?

TARGET DATE FOR COMPLETION OF PROJECTS

I have looked at this January 10 letter. You will notice page 11 of our statement which says:

> On this assumption, a tentative completion date for the first phase of the program was set at July 1.

I think that my previous statement of how the July 1 deadline was originally arrived at was correct; that it was derived originally from the Wray report. I think that it was picked up in this letter after discussions between the engineers and the Air Force. You will notice, however, in our statement that we go on to say that after it became evident, which was after January 10, that we were not going to be able to get into Morocco at the time we had originally planned, we did not modify our construction directives because we did not think there was any reason to do so. The construction directive there referred to was the letter of November 29.

Mr. DONNELLY. 1950.

Mr. UPTON. So I think we were mistaken in saying there is no letter referring to the July 1 deadline. However, I think the same reason applies, as I originally stated, as to why the July 1 deadline was no longer applicable—because the whole situation in Morocco changed with respect to our getting in there.

Mr. DONNELLY. With respect to the termination of the crash program, Mr. Perry, testimony has been in the record that the Corps of Engineers and the contractors were asked to do the impossible day after day and week after week and month after month after July 14 right up until the end of 1951.

They were asked to do yesterday what they, the Air Force, wanted today, and you said that you have read through the report. Do you have any comment to make on that?

Mr. PERRY. I read through the record, and I do not get any impression in such words as you have used.

Mr. DONNELLY. Mr. Bonny specifically testified to that.

Mr. PERRY. I have read the testimony that they wanted certain housing by some August 11 date, but I did not hear it up until the end of the year. There may have been one or two housing jobs that they needed in a hurry, but not week after week, month after month, up to the end of the year. There is nothing in the testimony that warrants that conclusion, in my judgment, at all. If Bonny said that, I would think that he would like to reconsider it.

Mr. DONNELLY. I am not quoting directly from the record. That is my recollection of the testimony with respect to the crash date.

Mr. Chairman, it has been the committee's desire to complete the record on Morocco, and to do so only after affording an opportunity to be heard to all of the organizations involved.

CORRESPONDENCE WITH PUSOM RELATIVE TO TESTIMONY ON MOROCCAN PROJECTS

Now, the Air Force has been heard this morning. The architect-engineer has not been heard from. However, at the direction of the committee, I addressed a letter on June 4, 1952, to the architect-engineer, that is, PUSOM, and transmitted copies of the page proof of the hearings and invited PUSOM to be here, if they desired to be heard. PUSOM replied on June 10, 1952, and indicated that at that time they had no additional information which they might contribute to the present record. I wrote back at the direction of the committee on June 12, 1952, to PUSOM and advised them of the five points upon which the Air Force desired to be heard and reiterated the committee's invitation to be heard, if they desired to be heard. They replied on June 19, 1952, and asked that they be permitted to read the page proof of the Air Force's testimony of today before they made up their minds whether they wanted to be heard, so at the committee's direction I wrote to PUSOM on June 29, 1952, and formally notified them the record would be closed today and that they might attend and hear the Air Force's presentation, and in addition might be heard after the Air Force was heard. I have here a letter of June 3, 1952, in which PUSOM states that it has withdrawn its reservation to be heard.

I would like at this point to have this exchange of correspondence included in the record.

Mr. RILEY. Without objection, it will be inserted in the record at this point.

(The correspondence referred to is as follows:)

JUNE 4, 1952.

Re Moroccan air base construction.

Mr. R. M. WAGNER,
Alternate Contract Director, PUSOM, New York, N. Y.

MY DEAR MR. WAGNER: This letter is in confirmation of my telephone conversation of today with Mr. Bailey of your office. The Subcommittee on Military Public Works of the House Appropriations Committee, of which I am counsel, held hearings on the Moroccan air base matter on April 9, May 12 through 16, and May 19, 1952. Representatives of the Corps of Engineers and of Atlas Constructors were then heard in detail. However, the Air Force and your organization, PUSOM, were not heard in these hearings.

The subcommittee has directed that copies of the page proofs be served on the Air Force and on PUSOM, together with an invitation to be heard, if either the Air Force or PUSOM desires to be heard. Accordingly, I transmit herewith three copies of the page proof. These cover all except May 16 and 19. The page proof for these 2 days will probably be available tomorrow, and I will forward them to you then.

In the event that PUSOM desires to be heard, in response to comments and observations made in the hearings with respect to PUSOM's performance or otherwise, the subcommittee would like to be so advised not later than June 11, and in such event would like to receive a list of the particulars on which PUSOM desires a hearing together with a statement of the pages in the page proof to which reference will be made.

All of the testimony has been taken in executive session, and none of it has been released publicly. At such future time as the record is completed, it is the intention of the subcommittee to publish the entire hearing.

Very truly yours,

JOHN J. DONNELLY, JR., *Counsel.*

NEW YORK 22, N. Y., *June 10, 1952.*

Re Moroccan air base construction.

Mr. JOHN J. DONNELLY, Jr.,
Counsel, Subcommittee on Military Public Works,
House Appropriations Committee,
House of Representatives, Washington, D. C.

MY DEAR MR. DONNELLY: Replying to your letter addressed to Mr. R. M. Wagner, our alternate contract director, under date of June 4, 1952, we have circulated the page proofs you sent us among our key personnel to the extent practicable in the time allotted. Although we would be glad to furnish your subcommittee with any pertinent facts within our knowledge, we do not believe that any additional information we might contribute to the present record would be material to the inquiry as a whole.

Your courtesy in furnishing us with the testimony and in giving us an opportunity to be heard is greatly appreciated. The Moroccan project is of vital concern to us, and we would appreciate being advised as to any additional testimony which may be given to your subcommittee relative thereto.

Sincerely,

PORTER-URQUHART AND SKIDMORE, OWINGS & MERRILL,
ASSOCIATED,
By N. A. OWINGS, *Chairman of the Governing Board.*

JUNE 12, 1952.

Re Moroccan air base construction.

Mr. N. A. OWINGS,
Chairman of the Governing Board, PUSOM, New York 22, N. Y.

MY DEAR MR. OWINGS: Thank you for your letter of June 10 in response to mine of June 4.

I note that you are not asking to be heard. In this regard, you should be advised that the Air Force in a letter of June 11 requested a hearing on the following points:

1. The urgent nature of the program.
2. Relationships among the Air Force, Corps of Engineers, Atlas, and the architect-engineers.
3. Site selections.
4. Master planning.
5. Standards of construction.

Because of other pressing matters including the Air Force's urgent request for an additional construction appropriation, it now appears that the Air Force will not be heard on Morocco for at least 2 weeks.

You indicate in your letter that PUSOM had studied the page proofs to the extent practicable in the limited time allowed. It is not the subcommittee's intention to foreclose you in any sense from deciding whether you desire to be heard. Do you wish to consider the matter further and advise?

Sincerely,

JOHN J. DONNELLY, Jr., *Counsel.*

NEW YORK 22, N. Y., *June 19, 1952.*

Re Moroccan air base construction.

Mr. JOHN J. DONNELLY, Jr.,
Counsel, Subcommittee on Military Public Works,
House Appropriations Committee,
House of Representatives, Washington, D. C.

MY DEAR MR. DONNELLY: Thank you for your letter of June 12 advising us of the items on which the Air Force has requested a hearing. We also appreciate your statement of the subcommittee's willingness to give us further time to digest the material covered on the page proofs.

On this basis, we would like to leave the matter of our being heard open until we have seen the page proofs of the Air Force's statements covering the five items listed in your letter and any others they may bring up.

We trust that this arrangement will be satisfactory to you and the subcommittee.

Sincerely,

PORTER-URQUHART and SKIDMORE, OWINGS & MERRILL,
ASSOCIATED,
By N. A. OWINGS, *Chairman of the Governing Board.*

JUNE 29, 1952.

Re: Moroccan air base construction.

Mr. N. A. OWINGS,
Chairman of the Governing Board, PUSOM,
New York 22, N. Y.

MY DEAR MR. OWINGS: The Subcommittee on Military Public Works will close the record on the Morocco problem during this week. In our exchange of letters, you indicated in your letter of June 19 that you wanted to reserve a decision on whether or not PUSOM desires to be heard until after the subcommittee has heard the Air Force and furnished you a copy of the page proof thereon.

Since it is expected that Congress will adjourn not later than July 5, the subcommittee has tentatively set a further hearing for Wednesday, July 2, to close the record. The Air Force will be heard at that time. If you or any of your representatives desire to attend and be heard after the Air Force's presentation, the subcommittee will be pleased to have you do so.

It will be appreciated if you will advise promptly of your intentions in the matter.

Sincerely,

JOHN J. DONNELLY, Jr., *Counsel.*

NEW YORK 22, N. Y., *June 30, 1952.*

JOHN J. DONNELLY, Jr., Esq.,
House of Representatives, Committee on Appropriations,
Washington, D. C.

MY DEAR MR. DONNELLY: Thank you very much for your letter of June 29 advising us as to the status of the hearings before your committee with regard to the Moroccan air base construction.

Inasmuch as you indicate that Congress will adjourn not later than July 5, and that you intend to close your records on July 2 with the Air Force being heard on that day, we respectfully withdraw our reservation to be heard, as requested in our letter of June 19, 1952, and consequently do not plan to appear.

We greatly appreciate your courtesy and consideration in keeping us informed as to the progress of the hearings.

Very truly yours,

PORTER-URQUHART AND SKIDMORE, OWINGS MERRILL, ASSOCIATED,
N. A. OWINGS, *Chairman of the Governing Board.*

Mr. RILEY. You may be excused, Mr. Perry, if you wish to leave.

Mr. PERRY. Thank you very much for the privilege of appearing before you, sir.

PROPOSED USE OF GUERCIF AS A BASE

Mr. RILEY. Mr. Upton, in the last issue of the Saturday Evening Post there is a story on the Moroccan situation. I was very much interested to read there of a base at Guercif, that this article stated, from a strategic standpoint, and from an engineering standpoint, was more ideal than any base that was selected. I am wondering why that base was not used.

Mr. UPTON. Mr. Chairman, I regret to say that the first I had heard of Guercif was when I read this story in the Saturday Evening Post and I am simply not able to answer the question. I can get the answer for you.

Mr. RILEY. I should be very glad to have the answer for the record, inasmuch as it was raised by that article.

Mr. UPTON. All right, sir. I shall try to get it for you.

Colonel DERBY. Mr. Chairman, I think I can supply that very readily, because it concerned a noncontroversial point. It was turned down because the logistics people considered that it would be

very difficult to supply. It is about 400 miles from the port, if I remember correctly. At any rate, it is a very considerable distance east of the port and the logistics people in the Pentagon turned it down for that reason after everybody else had agreed upon it.

Mr. RILEY. There is no railroad over there?

Colonel DERBY. There is a railroad over there, sir, but that is the reason they gave for turning it down. A 400-mile rail haul is very expensive, when you have to haul everything that gets in there.

Colonel KROEBER. The pipeline distance entered into it, also.

Colonel DERBY. To have brought a pipeline up there would have been very expensive, although I believe they were talking about making that a fighter base and leaving out the pipeline. Anyway, those logistic considerations were the reasons why it was turned down.

Mr. RILEY. In that same article, in regard to the much discussed base at Mechra bel Ksiri, they stated that a Pasha's palace had to be demolished and a railroad relocated, and a hill cut down, if an air base were put in there. I wondered whether that was true.

Mr. UPTON. Mr. Chairman, the only information I have on that is that a hill had to be cut down if the air base were adapted to certain purposes.

Mr. RILEY. This article stated that this Pasha's palace had to be torn down, a railroad rerouted; and that some of the railroad was rerouted. Colonel Derby, I wonder if you can throw any light on that?

Colonel DERBY. Those are things that would have had to be done if they wanted to make a bomber base out of it. That was not actually done.

Mr. RILEY. The railroad was not actually moved?

Colonel DERBY. No, sir.

Mr. RILEY. What about the Pasha's palace?

Colonel DERBY. No, sir. The Pasha's palace was not even touched. Those were things, if you had wanted to build a bomber base rather than a fighter base, would have had to be done.

Mr. RILEY. The impression I got from reading this article was that this palace had to be torn down and the railroad rerouted and some grading done on the hill. I wanted simply to clear that up for the record.

EXPENDITURES AT MECHRA BEL KSIRI

Mr. DONNELLY. Mr. Upton, Mr. Perry in his prepared statement said, with relation to Mechra bel Ksiri, that the estimate of the direct cost of this abandoned construction would be $126,000. My recollection is that General Myers testified previously for the record that the cost was $143,000. Which is the more accurate figure?

Colonel KROEBER. $126,000, in that neighborhood, I believe, plus or minus a thousand dollars, was the figure mentioned in the cost report as nonrecoverable cost.

Mr. RILEY. Did that include the moving cost? That is another item that was mentioned in this article in the Saturday Evening Post which said that not since the time of Hannibal had such a caravan ever crossed Africa.

(Discussion off the record.)

Colonel KROEBER. General Myers, in reference to these two figures, quoted one figure first and later corrected it in the record. I do not

have the Engineers' cost report here, but he quoted a corrected figure later on in the record.

Mr. DONNELLY. Would you supply for the record a tabulation of the items that the Air Force used in arriving at this figure?

Mr. UPTON. We would be glad to. I presume we will have to get the detailed breakdown from the Engineers.

Colonel KROEBER. They were taken from the Engineers' report.

Mr. DONNELLY. We can then tell from that which items, as the chairman mentioned, were in that caravan that moved over 200 miles from Ben Guerir to Mechra bel Ksiri and back to Ben Guerir.

Mr. UPTON. We will be glad to supply the information.

Mr. DONNELLY. In the testimony there also appears the statement that this figure of $143,000 or $126,000 represented only about half the full cost of the adventure at Mechra bel Ksiri; that the indirect cost will amount to 100 percent of the direct cost. Does the Air Force have any comment to make on that?

Mr. UPTON. We would be glad to supply a statement of the possible indirect costs. I do not know whether we can get that exactly.

Colonel KROEBER. Actually it is an engineering cost report figure and I think it would be more appropriate if that cost were furnished directly by the Engineers. We would have to furnish it by taking an extract from the Engineer cost report.

Mr. UPTON. Mr. Chairman, we would be glad to obtain from the Engineers a cost report showing the breakdown of the direct cost and, to the extent possible, the breakdown of the indirect cost which we will supply to the committee, if the committee prefers that it not be supplied directly by the Engineers.

Mr. DONNELLY. The transcript of this testimony will be submitted both to the Air Force and to the corps and if at that time this information could be supplied, it would be helpful.

(The Air Force subsequently supplied the following statement of the loss at Mechra bel Ksiri:)

DEPARTMENT OF THE AIR FORCE,
OFFICE OF THE GENERAL COUNSEL,
Washington, July 10, 1952.

JOHN J. DONNELLY, Esq.,
Counsel, Subcommittee on Military Public Works,
House Appropriations Committee, Washington, D. C.

DEAR MR. DONNELLY: In the course of the bearings July 2 on Moroccan airbase construction, you requested the Air Force to supply you with figures on both direct and indirect costs pertaining to construction activities at Mechra bel Ksiri. I am attaching as enclosure 1 to this letter cost sheets which, in our opinion, are the most detailed available cost data covering operations at Mechra. These data appear in a report of examination of cost records prepared by the Office of the Auditor General of the Air Force. The total cost reflected is $361,828.95. Those portions of the data identified as schedule B–5c and schedule B–6 would represent direct costs. It is probable in the opinion both of Air Force and Engineer representatives that some of the expenses reflected in the other portions of the data than those referred to above should rightfully be absorbed as indirect costs chargeable to the construction of the five main bases in French Morocco and not merely as chargeable to operations at Mechra bel Ksiri.

* * * * * * *

Sincerely,

ARVIN E. UPTON,
Deputy General Counsel.

CENSORSHIP EXERCISED BY AIR FORCE OVER CORPS OF ENGINEERS MESSAGES

Mr. RILEY. Mr. Upton, there is one other question I should like the Air Force to answer, if it will. Mr. Perry testified this morning that only general instructions were given to the Engineers through the Chief of Engineers and that the detailed planning and supervision of construction, and so forth, were left entirely to the Engineers. We would like to have the comment of the Air Force on the fact that Colonel Hardy refused to let Colonel Haseman send a telegram to his chief without Colonel Hardy's comments attached to it.

Mr. UPTON. Mr. Chairman, I would be glad to comment on that right now.

Mr. RILEY. We would be glad to have it, because if the Air Force is going to hold the Engineers responsible through the Chief of Engineers, the committee is very much interested in knowing why Colonel Haseman was not allowed to send his own messages without censorship.

Mr. UPTON. Mr. Chairman, I think the key to the question lies in the effect which the message might have had on negotiations that were going on with the French. As we tried to explain to the committee in our prior testimony, the Engineers, of course, had the responsibility for construction, but we had the responsibility of carrying on the negotiations with the French. The fact is that the negotiation and the construction aspects overlapped to a more considerable extent than we had ever envisaged in November of 1950. I think the reason for Colonel Hardy's and Colonel Haseman's difficulties arose out of that overlapping; the fact was that Colonel Haseman and Colonel Hardy had somewhat different ideas as to the extent the messages which Colonel Haseman wanted to send might affect the negotiations which had not been completed with the French.

Specifically, as I recall the testimony on that point, the issue arose over the fact that notification had not been received through local French channels that construction could proceed, although Colonel Haseman had received notification from the New York office of the Engineers that the agreement had been completed with the French and that construction could proceed. Colonel Haseman can correct me if I am stating these facts incorrectly. But I think that is about all there is to it. As we said before, it is something that happened over a period of about 2 or 3 days and I do not think directly affected the picture of the Engineers' construction responsibilities. It was a misunderstanding as to the relation between negotiation responsibility and the construction responsibility, which overlapped at that point.

Mr. RILEY. But the concern that we feel there is that Mr. Perry made the positive statement in this prepared statement this morning that instructions were issued through the Chief of Engineers and I do not see how you can hold the Engineers responsible if they cannot contact their chief and get their instructions directly from his office. If a certain amount of authority were vested in the representatives of both the Engineers and the Air Force in Africa, that throws a different light on the matter.

Mr. UPTON. I cannot disagree with that, sir. This particular misunderstanding, as I recall, was over a period of only about 4 or 5 days involving these two incidents which I believe happened between

April 19 and April 26. I certainly would agree that the Engineer representative has to get his instructions from his superior regarding construction if he is to be able to proceed with construction. The real question is: Would this request for instructions affect the negotiations which the Air Force was carrying on?

Mr. RILEY. Another question arises in regard to beginning construction at Mechra bel Ksiri instead of Benguérir. If I recall the testimony correctly, there was no directive from the Chief of Engineers Office on that score and again Colonel Hardy would not let the local engineer contact his superior without censorship.

Mr. UPTON. I think Colonel Hardy admitted that there was a hold-up on Benguérir but I do not recall the Mechra bel Ksiri issue as involving Colonel Hardy and Colonel Haseman.

Mr. RILEY. If I am not mistaken, they tried to contact their superior officers in order to get confirmation for the change.

Mr. UPTON. On page 400 of the record there is a reference to a letter from Colonel Hardy to Colonel Haseman authorizing beginning construction at Nouaseur, Sidi Slimane, and Mechra bel Ksiri; and the letter, which is quoted in the record, also states:

> No construction will be started at Benguérir until your headquarters is officially notified by this office.

Mr. RILEY. I believe you will find from the testimony that the Engineers' office never gave that instruction; that it was given by Colonel Hardy, or General Hardy.

Mr. UPTON. I am sorry, sir; I did not hear quite all of that.

Mr. RILEY. I believe if you read the testimony you will find that the instruction did not come from the Chief of Engineers' office, but came from General Hardy who was then Colonel Hardy.

Mr. UPTON. To begin construction?

Mr. RILEY. Yes.

Mr. UPTON. Yes, sir. That was as a result of the completion of negotiations. In other words, no construction could be begun until we had worked out our difficulties with the French.

Mr. RILEY. The point that I am concerned about is that in this prepared statement you say that all directives had to come from the Chief of Engineers' office and the testimony shows that they did not.

Mr. UPTON. Perhaps I have not explained it adequately to you. As I see it, the question is: What is a construction directive and what is not? The construction directives have to go through the Chief of Engineers' office; and, so far as I know, there is absolutely nothing in the record to indicate that they have not. But the question of when construction could actually begin depended upon the outcome of the French-Air Force negotiations, and that was the reason for Colonel Hardy's letter which I have just referred to.

Mr. RILEY. If I remember it correctly, if you open up the whole case, Colonel Hardy had an entirely different plan from anything ever proposed before, involving another base.

Mr. UPTON. I am simply not competent to testify on that aspect of the matter.

Mr. RILEY. What I was concerned about is, What directives had to come from the Chief of Engineers' office and what authority did the local representative of the Air Force have to order the Engineers around—if I may use that expression—or to issue orders to the Engineers?

Colonel KROEBER. May I attempt to reply to that?

Mr. RILEY. Yes.

Colonel KROEBER. The Air Force had been designated as executive agent of the Joint Chiefs of Staff for the negotiations with the French and was responsible to give clearance for entering the sites and initiating construction; and in that respect, and in that respect only, was the Air Force representative entitled to issue any orders to the local Engineer representatives; whereas in the matter of pure construction the directives were to come from the Chief's office.

(Discussion off the record.)

Mr. UPTON. Mr. Chairman?

Mr. RILEY. Yes.

Mr. UPTON. With respect to Mechra bel Ksiri, I have just noticed a statement in General Hardy's testimony at the bottom of page 410 and the top of page 411. He had discussed Mechra bel Ksiri with Mr. Sallagar and Mr. Mitchell, two special assistants to the Secretary of Air Force, and they had suggested delaying or suspending construction at Mechra bel Ksiri or Sidi Slimane, and he would not agree to that because that might affect the operations.

Mr. RILEY. Did he not also include Mechra bel Ksiri?

Mr. UPTON. Sir?

Mr. RILEY. Did not Mr. Mitchell and Mr. Sallagar include Mechra bel Ksiri?

Mr. UPTON. Include it?

Mr. RILEY. Yes, sir.

Mr. UPTON. They had discussed the possibility of suspending construction at Mechra bel Ksiri, Sidi Slimane, or Ben Guérir. My understanding of General Hardy's testimony is that he would not agree to suspend construction at Mechra bel Ksiri or Sidi Slimane. Rather, he would not agree to recommend to General Norstad that anything be held up there.

I also believe, Mr. Chairman, that at the time General Hardy was here testifying General Timberlake also testified at that time what seemed to be to him the disadvantages and advantages of the so-called Hardy alternate plan. Not being by any means an expert in Air Force operational matters, I am simply not qualified to testify about that.

Mr. RILEY. As I read this testimony, Mr. Mitchell and Mr. Sallagar wanted to suspend operations at Ben Guerir, Mechra bel Ksiri, or Sidi Slimane. The construction work had already started to a large extent on Sidi Slimane; so they went ahead with that.

I am just wondering why he felt it incumbent on him to go ahead with Mechra bel Ksiri also. There must have been a certain amount of authority invested in Colonel Hardy as the representative of the Air Force there.

(Off the record.)

(Discussion off the record.)

AUTHORITY OF AIR FORCE REPRESENTATIVE IN AFRICA TO SELECT SITES FOR CONSTRUCTION

Mr. RILEY. Mr. Upton, could you tell me what the authority was of the Air Force representative in Africa with regard to the designation of the bases on which construction was to be started and the further negotiations with the French?

Mr. UPTON. Mr. Chairman, I think that the Air Force representative's principal authority—speaking now of General Hardy during

the days when he was Colonel Hardy, as successor to General Hamilton—was to carry on to a successful conclusion negotiations with the French which had already been undertaken.

Mr. RILEY. Off the record.

(Discussion off the record.)

Mr. UPTON. He also had authority to release for construction to the Engineers bases which already had been approved. If he had any objection to any base that had already been selected, he had to refer that back to higher headquarters and he did do so in the case of Ben Guerir.

Mr. RILEY. Are there any other questions?

CONSTRUCTION OF GOLF COURSE AND CIVILIAN CLUBHOUSE AT McCLELLAN AIR FORCE BASE

Mr. DONNELLY. I think for the record, Mr. Chairman, passing to another phase of our relationship with the Air Force, I should invite the committee's attention to the chairman's letter of June 26, 1952, to Secretary Finletter, in connection with the construction of a golf course and civilian employees' clubhouse at McClellan Air Force Base, Sacramento, Calif.

The chairman in this letter requested answers to specific questions.

Separate and apart from that, the Air Force was requested in the budget hearings for a report on the McClellan Air Base proposition. Mr. Huggins told me on June 26th that the preliminary report would be available to the committee on Monday or Tuesday. To date—this is Wednesday—we have not heard a word from the Air Force on this matter.

The committee has expressed its desire that this matter be reported to the committee before Congress adjourns, in order that appropriate attention might be given to the matter. Mr. Upton, will you be good enough to get for the committee a statement from the Air Force today as to when the committee may expect this information?

Mr. UPTON. Yes, sir; I would be glad to call you as soon as I get back to the office.

Mr. RILEY. We thank you for your testimony, gentlemen.

SUBMISSION OF HISTORICAL ANALYSIS OF MOROCCAN SITUATION

Mr. UPTON. Mr. Chairman, am I permitted to offer for the record this historical analysis of the Moroccan situation?

Mr. DONNELLY. It bears the customary Air Force red stamp.

Mr. UPTON. It bears a "Confidential" stamp. Off the record.

(Discussion off the record.)

Mr. DONNELLY. In the colloquy off the record, Mr. Upton discussed the confidential nature of the document which he is tendering to the committee. It is the view of the committee that the document should be received for the committee's confidential study and use but should not be published or printed in any way.

(The document was received for the information of the committee.)

Mr. DONNELLY. Off the record.

(Discussion off the record.)

Mr. DONNELLY. Now, the Corps of Engineers has been here throughout this hearing today. The committee at this point wonders if the Corps of Engineers has any comments to make.

CORPS OF ENGINEERS OBSERVATION ON AIR FORCE TESTIMONY

General NOLD. Mr. Chairman, I should like to make a brief comment.

We are prepared to answer any detailed questions which the committee may wish to ask.

In respect to the statement presented by Mr. Perry, we find that the analysis of the testimony and certain of the statements therein are taken out of context, and our conclusions on many of the points covered there would be somewhat different from those arrived at in the paper. I should say parenthetically that we have just received that statement.

However, I feel that all those points were amply covered in the testimony which has been given heretofore. The only danger of such a paper is as it may confront a casual reader who is not interested in looking back into the testimony. I do not think that it would aid the committee particularly if we were to comment on certain areas of disagreement. It is all in the testimony, in my opinion, which has been received heretofore.

TESTING OF RUNWAYS AT NOUASSEUR AND SIDI SLIMANE

Mr. RILEY. General Nold, have you completed or have you had any investigation completed on the runways at Nouasseur and Sidi Slimane, to show whether or not the construction was up to the minimum standards which were requested for those installations?

General NOLD. Yes, sir; we have. I think it may serve the committee's purpose to have a brief answer to that question from General Hardin. He has been following the elaborate testing program quite closely, and if it pleases the chairman I will ask him to make a statement on that.

Mr. RILEY. The committee would be pleased to hear what testimony you have from the investigators as to whether or not the construction at Sidi Slimane and Nouasseur was up to the minimum standards prescribed for those locations.

General HARDIN. Mr. Chairman, beginning in February we initiated a comprehensive testing program of the various paved areas at both Sidi Slimane and Nouasseur. This testing program involves the making of what we call CBR tests, which means "California bearing ratio" tests, of the material in place. It is a time-consuming operation; and those tests, at the various places we feel it is necessary to make them in order to get complete coverage, will not be ready for evaluation until the 15th of July, at which time we propose to send a team of experts back to Morocco and with the architect-engineer evaluate the results of these tests.

For your information, I should like to point out that taking a CBR is really measuring the relationship of the shear resistance of the material in question as against a perfect material which we use as a sample of crushed stone. It is a test which was developed for design purposes, and really indicates in itself no particular properties other than what can be incorporated in a design formula.

The whole matter of design of flexible pavements is an empirical design procedure and is based upon long and exhaustive practical tests which we conducted in a laboratory in Mississippi in arriving at

a procedure for design. We tested samples of runway at this Mississippi laboratory, actually building them in place and destroying them by repetitive loadings of a vehicle which would approximate the wheel load of a plane.

The designs are based upon an unlimited number of repetitions of loading.

I go into this detail only to acquaint you with the fact that since there has been so much criticism of the design—most of the criticism has come from our own technicians' reports—I wanted to point out that when we talk about a runway having a capacity of so much we mean that that runway will have that capacity for an unlimited number of passings, with the repetition of loading being 5,000 or 6,000 without any appreciable effect on the surface. This, of course, is a most extreme assumption.

On the other hand, we also take these CBR values when the material is saturated and not in its natural state nor in its dry state. Therefore, that is another severe assumption as to the ultimate condition the material will be in during the life of the pavement.

So, in taking these CBR values we are attempting to reintroduce them into the design formulas and determine the effectiveness of the work.

So far the test results have indicated some variations between areas, and we have well been aware of some of those variations. However, it has been our concept from the beginning of this situation that it was very likely—and our technicians' reports so indicated—that great improvement could be had by additional compaction obtained by the use of what we call a supercompactor, a big machine which weighs several hundred tons. It is common practice to use the supercompactors now on the highest-grade highway construction, such as the New Jersey Turnpike, to develop areas that may need further treatment.

But you get a tremendous compactive effort from them.

DEFICIENCIES IN SOUTH WARMUP APRON AT NOUASSEUR

In taking these CBR values, we developed in a certain area of Nouasseur, the south warmup apron, that there were certain deficiencies in bearing value of the subgrade and the base course. The subgrade is the natural material and the base course is the rock or added material to improve the supporting value as you approach the surface layers.

So we began a series of tests which are now under way to determine what additional density in the material, even through the completed surface of the runway, could be obtained by the use of these super compactors. The results have been most encouraging. General Walsh reports to me in an interim report on this work at Nouaseur that he was able to obtain the compaction which had been sought in the beginning, and found not to be available, in all these CBR values, as developed by our testing procedure.

CORRECTION OF DEFICIENCIES

I should be glad to give you for the record a summary of eight locations, four of which are on the base course at Nouasseur and four

of which are on the subgrade at Nouasseur, showing the before and after values of the CBR tests, and also certain information in this tabulation about water-content ratios, both soaked and natural, which abbreviations are shown in a tabulation, but may not be clear to you as to what they mean. There is also a note at the bottom of this tabulation which indicates that substantial improvement has been gained by the additional rolling and that it is planned to do more of this rolling and have this data available for the evaluation group which will proceed on the 15th of July to Morocco additional information for determining what corrective action is necessary.

On the face of it it would appear from General Walsh's interim report that it would be a rather easy matter to correct most of these deficiencies which are in fact of limited extent, and that while what we call "some dental work" may have to be done in certain areas it will be of a minor extent. There is nothing in the way of any operational limitations on any of these paved surfaces except in the uncompleted one at Nouasseur, which I am sure you are familiar with, the apron which got wet and we could not use.

Mr. RILEY. Do you make these CBR tests in your own laboratories, or do you contract with some private laboratory?

General HARDIN. Well, they are made with a machine, Mr. Chairman, which in the in-place test is attached to a truck. We do that with our own forces, and we also have provided equipment to the architect-engineer, and he is assisting us in the performance of those tests. We do it both ways.

Mr. RILEY. It is customary for the Engineers to make these tests on all completed runways to see that the specifications have been carried out; is that not true?

General HARDIN. Yes, sir. We do that as a routine matter. If it is not immediately after construction it is shortly thereafter, as soon as we can get around to it with the limited equipment we have.

Mr. DAVIS. As to the alligatored spot, has that been patched? What did you do with that?

General HARDIN. I do not believe I can answer that, Mr. Davis. It had not been repaired the last time I talked to General Walsh. Whether it has been repaired at this time I could not say.

It was apparently of narrow width and did not really affect the operational use of that taxiway. It was a lane, as described to me, of about 20 feet wide. It was just about the lane of a dumping operation with the trucks which carried the material from the pit to the taxiway.

VALUE OF SEAL COAT ON RUNWAYS

Mr. RILEY. General, I believe there is a statement in the testimony that a seal coat was being put on these runways. Do you not think that would be beneficial, in addition to the other work?

General HARDIN. A seal coat, Mr. Chairman, meaning a seal coat on top of the bituminous surfacing, can have some value, of course. We have expected to get, and the tests have indicated we will get, materially improved density in the bituminous surfacing by this rolling operation with the very heavy equipment. Its effect is very marked, not only on the bituminous surface, when the weather is hot, but also the penetration through the base course and down into the subgrade. We get beneficial compaction from top to bottom.

Mr. RILEY. As a result of this compaction your load-carrying qualities of these runways would be improved, in your opinion, to the extent that so far as it is foreseeable any trouble would be eliminated?

General HARDIN. At this stage of the investigation, we are very encouraged in that direction.

Mr. RILEY. We thank you very much.

INTERIM REPORT ON REEVALUATION OF SOUTH WARM-UP APRON AT NOUASSEUR

Without objection, we will insert this photostat chart showing the results of the tests in the record at this point.

(The document is as follows:)

INTERIM REPORT ON REEVALUATION OF SOUTH WARM-UP APRON—NOUASSEUR

An evaluation study made on the south warm-up apron at Nouasseur disclosed deficiencies in the bearing value of the subgrade and base course. At the time it was recommended that heavy pneumatic tired rolling of the area be carried out to determine the improvement which could be obtained in the deficient materials.

In FED evaluation report titled—"Evaluation Studies, South Warm-up Apron, Nouaseur," a program was outlined and instituted to reroll the apron with a 200-ton pneumatic-tired roller on the existing 2-inch asphaltic concrete binder course and reevaluate the subgrade and base course periodically during compaction until results indicate successful or unsuccessful conclusions.

The results of the evaluation upon completion of eight passes on four coverages with the 200-ton roller are summarized in the following table:

	Before	After	Before	After	Before	After	Before	After
BASE COURSE								
Station	0+35	0+35	0+66	0+66	0+33	0+33	0+62	0+62
Offset	80 E	80 E	128 E	128 E	177 E	177 E	222 E	222 E
Soaked cer	44	70	50	95	35	68	40	69
Soaked W. C	11.5	11.4	9.3	10.1	13.5	11.8	15.5	12.0
Natural W. C	8.9	10.6	6.3	8.6	10.2	11.6	8.9	10.2
Field Dens	124	136	120	(1)	130	(1)	133	(1)
SUBGRADE								
Station	0+35	0+35	0+66	0+66	0+33	0+33	0+62	0+62
Offset	80 E	80 E	128 E	128 E	177 E	177 E	222 E	222 E
Soaked CBR	21	22	10	22	28	37	12	22
Soaked W. C	13.9	16.5	20.8	19.1	15.8	18.5	23.0	17.5
Natural W. C	14.4	14.8	15.3	16.7	16.4	17.8	11.9	14.0
Field Dens	114	115	103	113	99	110	108	111

[1] Erratic and inconclusive.

It will be noted that substantial improvement has been gained by the additional rolling and it is planned to be reevaluated again after an additional six passes of three coverages. These results indicate the average percent increase in bearing capacity of base course subgrade to be 45 percent and of the base course to be 90 percent.

The before and after tests were made within 5 feet of each other.

Mr. RILEY. We thank you, gentlemen.

The committee will stand adjourned.

THURSDAY, SEPTEMBER 18, 1952.

RESULTS OF ON THE GROUND TESTS AND INVESTIGATIONS

WITNESSES

LT. GEN. LEWIS A. PICK, CHIEF OF ENGINEERS
MAJ. GEN. G. J. NOLD, DEPUTY CHIEF OF ENGINEERS
BRIG. GEN. JOHN R. HARDIN, ASSISTANT CHIEF OF ENGINEERS FOR MILITARY CONSTRUCTION
BRIG. GEN. O. E. WALSH, DIVISION ENGINEER, MEDITERRANEAN DIVISION, OFFICE OF CHIEF OF ENGINEERS
JOSEPH W. BISHOP, JR., ESQ., DEPUTY COUNSELOR, DEPARTMENT OF ARMY
CHARLES HASKINS, ESQ., OFFICE OF DEPARTMENT COUNSELOR, E. MANNING SELTZER, ESQ., CHIEF, LEGAL DIVISION, CORPS OF ENGINEERS, DEPARTMENT OF THE ARMY
COL. GEORGE T. DERBY, FORMER DISTRICT ENGINEER, ATLANTIC DISTRICT
LT. COL. L. L. HASEMAN, FORMER DEPUTY DISTRICT ENGINEER, EAST ATLANTIC DISTRICT
ROBERT R. PHILLIPE, OFFICE OF CHIEF OF ENGINEERS
THOMAS B. PRINGLE, OFFICE OF THE CHIEF OF ENGINEERS
BRIG. GEN. C. C. FENN, OFFICE OF LEGISLATION AND LIAISON, DEPARTMENT OF THE ARMY
COL. ALLEN H. FOREMAN, OFFICE OF INSPECTOR GENERAL, ARMY
GLEN W. MAXON, MAXON CONSTRUCTION CO., INC.
J. E. BURKE, VICE PRESIDENT AND TREASURER, MAXON CONSTRUCTION CO., INC.
RALPH F. KEENAN, VICE PRESIDENT, PACIFIC BRIDGE CO., MAXON GROUP
FRED I. ROWE, PRESIDENT, W. L. JOHNSON CONSTRUCTION CO., MAXON GROUP
JOHN P. H. PERRY, DEPUTY FOR INSTALLATIONS, AIR FORCE
JOHN B. BONNY, ATLAS CONSTRUCTORS
JAMES D. McCLARY, ATLAS CONSTRUCTORS
C. N. WHILDEN, ATLAS CONSTRUCTORS
RALPH E. MILLS, ATLAS CONSTRUCTORS
HON. PAUL V. McNUTT, COUNSEL FOR ATLAS CONSTRUCTORS
HENRY A. DUDLEY, ESQ., OF COUNSEL FOR ATLAS CONSTRUCTORS
BRUCE D. McCREARY, PORTER, URQUHART CO. AND PUSOM

PRESENT

JOHN J. DONNELLY, JR., ESQ., SUBCOMMITTEE COUNSEL
JOHN F. DOYLE, ESQ., ASSISTANT COUNSEL

Mr. RILEY. The committee will come to order.

INTRODUCTORY STATEMENT

We have reconvened to complete the hearings on the construction work in Morocco. Certain tests and investigations have been under way, and the committee is interested to know the results of these on-the-ground investigations and these tests.

The committee will start work at 10 in the morning and run to 12.30; reconvene at 2 o'clock, and I do not know when we will quit.

We want to wrap this investigation up this week, if it is at all possible, and we will ask Mr. Donnelly now to proceed with the inquiry.

Mr. DONNELLY. Mr. Chairman, the hearing this morning is attended by representatives of the Corps of Engineers, headed by Lieutenant General Pick, the Chief of Engineers, and other high-ranking officers of the Corps of Engineers who have had much to do with Moroccan construction.

Also present this morning are members of Atlas Constructors, the prime contractor for the job, represented here by eminent counsel.

In addition, the committee has before it this morning the survey group appointed by the Secretary of the Army, which is headed by Mr. Glen W. Maxon, with three of his colleagues.

The Air Force is represented by Mr. John P. H. Perry, who is Deputy of Installations in the Office of the Secretary of the Air Force.

The architect-engineer, PUSOM, is represented here today by one of its members, Mr. Bruce D. McCreary of the Porter, Urquhart Co., a component of PUSOM.

In addition, we have here representatives of the Department of the Army headed by Joseph W. Bishop, Jr., Esq., Deputy Counselor of the Department of the Army, who has succeeded the Honorable Fred Korth.

Also, we have a representative from the Office of the Inspector General of the Department of the Army.

As you have stated, Mr. Chairman, the purpose of this hearing is to receive the results of the tedious, months-long tests conducted concerning the construction performance in Morocco, and also to receive the report of the current status of the management, organization, cooperation, and coordination, which was made by the Maxon group.

With respect to the architect-engineer, Mr. Porter, who is one of the principal officers of PUSOM, he is today engaged in testifying in a Federal court before a jury in litigation which arose out of the Moroccan job. The judge did not deem it wise to excuse Mr. Porter, and he will be here tomorrow, we expect.

The agenda today breaks down very readily into two components. The first component is the report of the Maxon group which has to do with the current status of the operation.

The Maxon report is conditioned upon the final tests and the evaluation of them which took place in Morocco some days or week after the Maxon group had concluded its survey on August 14, 1952, so that actually, as the Maxon report states, it does not attempt to go into the evaluation of the construction or the necessity, or the extent of any corrective action.

The Maxon report was filed with the Secretary of the Army on Monday of this week, September 15. In the report the Maxon group states that it is satisfied with the competence of the officers and the personnel who have been conducting the California bearing ratio and other tests to determine the extent of any deficiencies that may have existed there on the Moroccan job.

The second component of the hearing will have to do with the results of the final tests.

In the latter days of August, after the Maxon group cut-off date of August 14, there was a high-level conference held in Morocco attended by Lieutenant General Pick, the Chief of Engineers; General Hardin, the Assistant Chief of Engineers, for Military Construction; General

Walsh, the Division Engineer, who has supervision over all of the Moroccan job; representatives of the architect-engineer; representatives of Atlas; and representatives of the Air Force.

I have been advised by General Pick that at that meeting all the results were available and evaluated, and that Mr. Porter, the head of PUSOM, made an estimate of corrective action in the amount of $1,160,000.

My understanding is that estimate was made by the architect-engineer; concurred in by the Chief of Engineers; by the Air Force and by all others present and concerned.

The question of the firmness of that estimate, or the method by which it was arrived at, will be the subject of consideration in the hearings here.

Upon his return to this country General Pick made a report to the Secretary of the Army which was furnished promptly by the Secretary's Office to the committee. I do not know whether it was the same Mr. Porter who was in Morocco or not.

General PICK. Yes.

Mr. DONNELLY. Mr. Porter made a report to General Pick, which is in the same general terminology and defined the same type of corrective action that General Pick reported to the Secretary of the Army.

It would appear more logical to defer the consideration of the second phase; that is, the evaluation of construction and the extent of corrective action, until Mr. Porter can be here so that we will have the benefit of his direct testimony and the view of the Chief of Engineers, of the Air Force, the contractor and all others concerned.

We will commence then with the first phase, if that is agreeable, Mr. Chairman, that is, the current status of operations of the Maxon group headed by Mr. Glen W. Maxon. They filed a report which is some 55 pages long. In the report Mr. Maxon lists those gentlemen who participated with him. Of the number, which approximates 10 or 12, we have here this morning Mr. John E. Burke, vice president and treasurer of the Maxon Construction Co., Inc.; Mr. Ralph E. Keenan, vice president of the Pacific Bridge Co.; and Mr. Fred I. Rowe, president of W. L. Johnson Construction Co.; in addition to Mr. Maxon himself.

Now, Mr. Maxon asked me what the extent of his testimony would be here today. He said that the report stands on its own feet, and in a large sense speaks for itself.

Representing the committee I stated to him that the members themselves would like to hear directly from Mr. Maxon and the survey group, some comments with respect to the survey and with respect to the report and to explore some of the statements that are containued in the report. If that is agreeable, that is what we will do, Mr. Maxon.

Mr. Maxon, would you want to make a general statement, or would it help if I would ask some questions as we go along?

Mr. MAXON. In our report we have made a general statement. I do not know that we should attempt to enlarge upon that, but we certainly are most willing to clarify any question in the report by statements here—anything that you do not understand. If there are particular general statements that you would like to have from us, we will be most happy to try to comply.

REPORT OF THE MAXON GROUP

Mr. DONNELLY. Mr. Chairman, may there be printed in the record the full report of the Maxon group which is transmitted by letter of September 9, 1952, by Mr. Maxon to the Secretary of the Army?

Mr. RILEY. First, I think that there should be inserted in the record the letter to the Maxon group from Secretary Pace, and then the Maxon report.

(The matter referred to is as follows:)

JUNE 13, 1952.

Mr. GLENN MAXON,
Maxon Construction Co., Dayton, Ohio.

DEAR MR. MAXON: I want to express my appreciation to you for your willingness to undertake a survey on behalf of the Department of the Army in connection with air base construction in French Morocco. In accordance with your decision I wish to outline the general scope of the survey and report which I have asked you to make.

In my letters of March 21 and April 14 to Senator Lyndon B. Johnson I reviewed actions to be taken, or already taken, to secure additional information and to correct deficiencies as to the work being done in connection with the Moroccan air bases. In those two letters, I indicated that an outstanding authority would be chosen to examine the situation both in Morocco and in this country—independently of the Army, Air Force, and Atlas—in order to be sure that proper remedial steps have been taken, and to recommend whether further steps are needed. This is the basic statement of your mission.

Prior to the date of my letter, and subsequently, witnesses before the Senator Lyndon Johnson Subcommittee on Preparedness of the Senate Armed Services Committee alleged numerous instances of faulty construction, general mismanagement, and waste in connection with the construction of the Moroccan air bases. Though I shall not attempt to itemize all these allegations, I believe that in general they fall into the following categories: (1) failure to comply with specifications in building the taxiways, aprons, and runways both at Nouaseur and Sidi Slimane, (2) failure to maintain adequate property accounts, controls, and procedures, (3) inadequate records of cost, (4) laxity of control over the working force and insufficient control over timekeeping, (5) unsatisfactory maintenance of standards with respect to the construction of buildings, especially housing, (6) improper procurement procedures and consequent payment of excessive prices for local purchases and services, and (7) possible kick-backs, bribes, and collusions. Some of these points have already been fully investigated and some have been discussed at length before Senator Lyndon Johnson's subcommittee and before a subcommittee of the House Appropriations Committee. All of them are being formally investigated by the Army at this time. Under the circumstances we can scarcely expect you to take the time to analyze all the historical data already of record on these points.

For this reason I shall ask you to concentrate upon a survey to determine whether the job is now being handled properly, whether any deficiencies now exist, and what remedial action is necessary. As indicated in my original letter to Senator Johnson, I consider it essential for you to furnish us with your independent views.

Specifically, concerning the seven allegations listed above, I wish you to review the organization in Morocco, including the organization of the Corps of Engineers, the architect-engineers, and Atlas Constructors, as well as the Air Force liaison group, and in addition to inspect the New York procurement office, and to advise me as follows: (1) to what extent are there any present evidences of deficiencies and waste in connection with the Moroccan air base construction, (2) are steps presently being taken to remedy these defects, including specifically the tests currently being conducted with respect to the runways, taxiways, and aprons at Nouaseur and Sidi Slimane, (3) are the steps taken sound measures to assure that the project is completed in a workmanlike manner, (4) if any defects presently exist, what remedial action do you recommend. In addition to the foregoing, I should like to stress the importance of a cooperative and cordial working relationship between the representatives of the Corps of Engineers, Atlas Constructors, architect-engineer, and the Air Force. I would therefore ask you to include in your survey a report upon the working relationships in the existing set-up, which has been greatly reorganized since March of this year.

In the performance of your survey you shall have authority to call on all interested parties, including Army, Atlas Constructors, and architect-engineer personnel for any and all information which you may need. Mr. Huggins, Assistant Secretary of the Air Force in charge of installations, assures me that you will obtain similar cooperation of all Air Force personnel. You will be furnished with all assistance, including personnel, which you may need in carrying out your mission. I can assure you further that your report, when made, will not be subject to amendment without your consent.

I understand that despite your broad experience you do not wish to set yourself up as an expert on all technical phases of the work at the Moroccan air bases, as for example the standards and specifications for runway construction. At the same time if there is any question in your mind of the adequacy of the tests being made or the steps taken to remedy any irregularities, I shall welcome your suggestions as to persons who may be qualified to assist us to insure the highest standards of construction and management.

Sincerely yours,

FRANK PACE, Jr.,
Secretary of the Army.

DAYTON, OHIO, *September 9, 1952.*

To: Secretary of the Army, Washington (25), D. C.
From: G. W. Maxon.

Subject: Report of survey requested by letter June 13, 1952, Air Base Construction, French Morocco.

DEAR MR. SECRETARY: The requested survey has been completed. We have reviewed the facilities and organizations as directed. With respect to the specific questions in paragraphs 5 and 7 of your letter of June 13, our report follows. For your convenience the statement of conclusions and recommendations drawn from our observations precede the body of the report.

In submitting the same I wish to commend most sincerely the gentlemen comprising the survey group, each of whom has given freely the time and energy necessary.

I desire also to commend for their thorough cooperation the personnel of the Corps of Engineers, of Atlas Constructors, of the architect-engineer and of the Air Corps liaison officer.

Sincerely,

G. W. MAXON.

REPORT OF SURVEY OF AIR BASE CONSTRUCTION IN FRENCH MOROCCO

CONCLUSIONS AND RECOMMENDATIONS

A. There exists in the central base at Casablanca and Nouasseur, and in each of the construction areas a competent and well-organized staff at top level of all management agencies. If deficiencies exist or occur at other levels this staff can be relied upon to correct them.

Management is aware of all factors required for an orderly construction program and is diligently functioning to eliminate all adverse elements within its control. It has been handicapped at times by an intermittent flow of construction directive and by lack of funds. We recommend prompt action to provide construction authority and funds to support an orderly and continuous operation.

B. Pavements now being constructed appear to meet the requirements of the specifications and good construction procedure. Certain portions of the pavements previously constructed at Sidi Slimane and Nouasseur do not fully meet current specification requirements; tests and evaluation studies are under way in these areas, and revaluation operations, together with the tests, are expected to provide in the near future data necessary for an estimate of the quantity of corrective action and of its probable cost. Since specific estimates as to quantity and cost can be determined only by engineering studies requiring considerable time and personnel, no attempt was made by our survey group to duplicate the effort of others in this respect.

The tests now under way are adequate to determine steps necessary to insure correction of deficiencies in these facilities. In our opinion the personnel of each agency charged with this responsibility is competent to determine the required degree of correction and to program corrective action with regard to economy,

the requirements of Air Force Command, and without delay to progress at other facilities now under construction.

We recommend that continuation of the tests and corrective action be left in the hands of these agencies.

C. A sincere effort exists in all groups to coordinate the separate operations of each to produce an orderly and economical conversion of funds into facilities. There is a cordial working relationship at group levels interviewed.

D. The field operations of Atlas Constructors are well organized and properly supervised. The personnel will average in competency with that of other organizations of this character and magnitude.

E. The New York office of Atlas Constructors is supervised by a capable staff of individuals with experience in construction activities. Administrative procedures and controls conform to acceptable standards. Office arrangement and flow are orderly. The office staff appeared full for current operations, but this is a matter best resolved by those having an intimate knowledge of the expected workload—the district engineer and Atlas Constructors' business manager.

F. The French Morocco central office and project offices of Atlas Constructors are staffed with supervisors who, on the average, compare favorably with those on other projects of this character. Administrative procedures and controls conform to acceptable standards. Office arrangement and flow of work are orderly except purchasing and property accounting which were being regrouped or reorganized. Staff is full but management expects attrition to reduce the excess.

The timekeeping procedures provide ample control for timekeeping operation.

Purchasing department procedures are in accordance with good practice which provide control of this function.

Property accounting records are now being prepared, using the most recent inventory as the starting base. The proposed records and procedures should be adequate to account for property. Top management should continue to give this operation constant attention until it is brought to a current status in all respects.

Cost records are not current. Additional help should be provided in the cost engineering section, if necessary, to keep cost records current. Method of costing materials drawn from inventories does not make for accuracy. This operation should be reviewed with property accounting procedure with the view of clearing the property record and the inventory account when materials are issued from inventories.

Authority, Purpose, and Scope

The survey of the air-base construction in French Morocco which forms the subject of this report was made pursuant to a request from Hon. Frank Pace, Jr., Secretary of the Army, for the Department of the Army.

The purpose of this survey, therefore, was to examine the situation in French Morocco and in the United States and to render an independent and unbiased report of the current status of operations. The scope of the survey encompassed the following primary aims:

(*a*) To determine to what extent any deficiencies and waste currently exist in connection with the French Moroccan air-base construction.

(*b*) To determine what steps are currently being taken to remedy any existing deficiencies.

(*c*) To determine, specifically, what steps are currently being taken in relation to the tests being conducted with respect to the runways, taxiways, and aprons at Nouasseur and Sidi Slimane bases.

(*d*) To determine whether the remedial steps being taken are sound and will assure that the project is completed in a workmanlike manner.

(*e*) To recommend any remedial action deemed necessary.

(*f*) To determine the status of working relationship between the various principals involved.

Survey Personnel

To successfully execute the intent of the survey it was essential that able individuals qualified by experience for the task at hand, be selected. The individuals finally selected to form the survey group are listed below.

Review of Atlas Constructors' New York office:

J. E. Burke, vice president and treasurer, Maxon Construction Co., Inc.
Glen W. Maxon, Jr., vice president, Maxon Construction Co., Inc.
Russel J. Morgan, chief accountant, Maxon Construction Co., Inc.
Herbert J. Schnack, chief administrative assistant, Maxon Construction Co., Inc.

Review of operations, French Morocco:
Ralph T. Kennan, vice president, Pacific Bridge Co.
Fred I. Rowe, president, W. L. Johnson Construction Co.
Glen W. Maxon, president, Maxon Construction Co., Inc.
John E. Burke, vice president and treasurer, Maxon Construction Co., Inc.
Herbert J. Schnack, chief administrative assistant, Maxon Construction Co., Inc.
Joseph P. Laws, construction engineer, Maxon Construction Co., Inc.

The members of the survey group have broad experience, both within and without the continental limits of the United States, in construction operations of the type surveyed. They are all currently and actively engaged in construction as a life work.

The survey group, although working as a coordinated body, was divided into two teams; the operational team and the procedural team. The task of the operational team was the inspection of the technical phases of the project, construction plant and construction operations. The task of the procedural team was the review of the administrative and control functions.

Period of Survey

The survey was conducted from June 24, 1952, through August 14, 1952, and was divided into two parts; namely the inspection of the New York office of Atlas Constructors and the inspection of the operations in French Morocco. The review of the New York office of Atlas Constructors was conducted prior to going to French Morocco so that the "feel" of the stateside operations could be obtained and later reflected in the scheme of the over-all operations. The New York office was reviewed by the procedural team from June 24 through June 26. The inspection of operations in French Morocco was conducted from July 31, 1952, through August 14, 1952.

No attempt is made in this report of the survey to include the details of the data and facilities examined. Actual physical inspection of the construction sites, servicing facilities and administrative officers were conducted. Group conferences and individual discussions, not only of the principal management but of the operational personnel, were held with all of the organizations. This report covers the observations of the major elements pertinent to the over-all operations from which the conclusions of the survey have been drawn. The main body of the report follows.

Orientation Conferences

Upon arrival at Casablanca, French Morocco, orientation conferences were immediately arranged with all the principals. A record of these conferences follows.

Conference No. 1

At 3 p. m., July 31, 1952, Mr. Maxon conferred with Gen. O. E. Walsh, commanding Mediterranean Division, Corps of Engineers. The general was accompanied by his executive officer, Col. G. W. Carlson, and members of his staff, and his Civilian French representative, Gen. J. Le Vavasseur. At this conference arrangements were made to meet with General Walsh and his staff at 9 a. m., August 1 and to hold later a conference at Nouasseur with Colonel Campbell, district engineer, Atlas Constructors, the architect-engineer and the Air Force liaison.

Conference No. 2

At 9 a. m., August 1, 1952, all members of the survey group conferred in the division office of the Corps of Engineers with General Walsh, his executive officer, Colonel Carlson, his chief engineer, Mr. Calloway, and his administrative assistant, Mr. Hannon. In this conference Mr. Maxon explained the authority for the survey and its scope.

General Walsh then briefed the survey group on the scope of the operations of Atlas Constructors. The survey group was advised that currently there are operations on three of the five bases and that except for engineering studies little work had been done on either Boulhaut or El Djema Sahim Bases.

The functioning of the French Commission was explained to the survey group with special reference to the fact that it has the right to construct all off-base utilities; that is, power lines, railroads, public highways, water lines and POL systems which are required to be relocated or to be constructed as new facilities to service the bases. In effect the money for such construction is turned over

to the French Commission which then takes lump-sum bids. These bids are subject to the approval of the Corps of Engineers. General Walsh stated that the bids received to date have been quite satisfactory. The POL system was designed by Fay, Spofford, and Thorndike, under a subcontract with Porter-Urquhart, Skidmore, Owings, Merrill, project architect-engineers responsible to the Corps of Engineers for engineering studies, design, and inspection, hereinafter referred to as PUSOM.

The contractors on the POL system include Battingnolles, Morrison-Knudsen, General Walsh advised approval was obtained from the Chief of Engineers, Corps of Engineers, to have Morrison-Knudsen as a part of the French Moroccan contractors syndicate. Battignolles, Morrison-Knudsen provides the experience desired. Atlas Constructors have no responsibility for this contract.

General Walsh then stated he had recommended that the building construction program be placed on a lump-sum basis using local contracting firms. Lump-sum subcontractors are now working at Nouaseur Base. It is planned to receive bids on the additional building construction and if bids are satisfactory to make contract awards. Atlas Constructors is responsible for the performance of the contract but the awards are made subject to approval by the Corps of Engineers. The conference adjourned and we proceeded to the Nouasseur administrative headquarters with General Walsh.

Conference No. 3

In the office of Col. J. P. Campbell, district engineer, we were introduced to the following, who assembled for the conference with General Walsh and the survey group.

Atlas Constructors:
Mr. Ralph Mills, partner
Mr. Lyman Wilbur, resident partner
Mr. N. D: Teters, construction manager
Mr. Edward Shaver, foreign business manager
Corps of Engineers:
Col. J. P. Campbell, district engineer
Lt. Col. R. P. Davidson, executive officer
PUSOM:
Mr. James Porter, partner
Mr. Jan Porel, general manager
Mr. Edward Merrill, assistant general manager
Air Force Liaison:
Col. J. A. Barnett, French Morocco and East Atlantic division

Colonel Campbell opened the meeting and then deferred to General Walsh, who advised the purpose of the survey and of the fact that the survey group came to French Morocco as representatives of the Secretary of the Army, Mr. Frank Pace, Jr. General Walsh added that during the course of the survey Colonel Campbell and members of his staff would be called upon for assistance and it was his desire that all four agencies cooperate fully in furnishing information that might be requested. General Walsh then turned the conduct of the meeting back to Colonel Campbell, who gave his assurance that he and his entire staff would be available at all times to assist the survey group.

Colonel Campbell then turned the meeting over to Mr. Maxon who introduced all members of the survey group and stated briefly the experience and background of each member. Mr. Maxon stated that the survey group would be divided into two teams of three men each. One team would survey the field operations, the other would survey administrative procedures and controls. He then expressed a desire to first make a general survey of all bases and that during this survey representatives of each of the agencies be present. He stated that he wished to interfere as little as possible with the routine operations of either individuals or agencies in the conduct of the survey. He suggested that the first inspection trip be to the project being the least advanced toward completion, and lastly to the project being farthest advanced toward completion.

During the discussion the survey group was informed that work is in progress at Nouasseur, Sidi Slimane, and Benguérir Bases. Also that some field investigations had been previously carried in by PUSOM at El Djema Sahim and Boulhaut, but that no actual construction had been done at either base. At Boulhaut Base there is a partially constructed access road, a few small living quarters, and a portable pilot crushing plant installation. It was stated that no further authority had been issued at this time for construction operations on

either of these bases. Colonel Campbell and Mr. Teters explained briefly the various operations at each base. The flow of materials and supplies from dockside to their destination was outlined. Following a brief discussion on these questions it was decided that the survey group would proceed to Benguérir Base early the next day. Mr. Maxon then stated that it was his desire that our plan of procedure and the assistance given by the agencies would result in securing the desired information in the shortest practicable time. At this time a meeting was arranged to be held in the afternoon between the survey group and Atlas Constructors. The conference then adjourned.

Conference No. 4

At 2 p. m. the entire survey group met with Atlas Constructors, represented by Messrs. Mills, Wilbur, Teters, Shaver, Coyne, head of the procurement division, and Prior, head of supply and property. The Atlas Constructors' staff explained their organizational structure, also the necessity of separating their employees into three groups, namely Americans, Moroccans, and all others. They explained that varying customs and regulations affecting each of the several groups resulted in a complicated rate structure and payroll system. These varying regulations come about through circumstances beyond the control of Atlas Constructors. This same condition applies to any of the agencies employing the above various classes of labor.

It was stated that Arab labor does not live in Atlas Constructors' construction camps, but is transported to and from each job site by commercial transportation or equipment operated by Atlas Constructors. European and American labor live in the construction camps or elsewhere at the individuals' discretion. Transportation about the job sites is provided by Atlas Constructors.

Atlas Constructors was asked about the size and status of their organizations at the general headquarters at Nouaseur and at each project area. They replied that their procedure and control organizations at the general headquarters are somewhat in excess of their immediate requirements but that these were gradually being reduced by the completion of employment contracts and terminations due to the uncertainty of a continuing volume of productive work.

Atlas Constructors was asked further concerning the work now under way and the value of uncompleted work definitely assigned to them, which had definite funds allocated for its execution. It was stated that the total work assigned to Atlas Constructors represented approximately $300,000,000 for the prosecution of which they had been allocated $201,000,000. Of this amount $189,000,000 had been expended or committed. Commitments included an estimated amount for cancellation and termination reserves. There is an uncommitted amount of $12,000,000. The estimated payrolls are $3,000,000 per month. They had assurance that additional funds would be available for near future requirements.

Atlas Constructors was then asked whether or not the flow of plans and specifications came to them in proper sequence and in sufficient volume to utilize to capacity the present organization. The reply was: In a general way yes, but the character of the work requires frequent changes in the plans and specifications. Stop orders are at times necessary and result in delays due to the flow of responsibility. Atlas Constructors advised, however, that through the efforts of General Walsh and Colonel Campbell and the Air Force liaison officer, Colonel Barnett, this condition had greatly improved and that organizational planning is now being studied which should eliminate this difficulty. The meeting then adjourned.

Brief History of Survey Group Inspections

August 1, 1952—Nouasseur-Casablanca.—The operational team, accompanied by Mr. Mills and Mr. Wilbur of Atlas Constructors, inspected the quarry operation, crushing and screening plants, warehouses, and storage areas.

The procedural team, accompanied by Mr. Whildren and Mr. Prior, of Atlas Constructors, checked the warehouses and storage areas at Nouaseur. The unloading dock, material in transit area, and food warehouses located at Casablanca were also inspected by the procedural team.

August 2, 1952—Benguérir.—The operational team, in the company of Messrs. Mills and Teters, of Atlas Constructors, Messrs. Porter and Merrill, of PUSOM, Lieutenant Colonel Davidson, Colonel Crouch, area commander, and Mr. Burris, project manager for Atlas Constructors, inspected the quarry operations, crushing and screening plants, asphalt plants, concrete-block plant, runway, taxiways, aprons, camp and recreational facilities, cafeteria, warehouses, storage area, shops, motor pool, POL, and utility systems.

The procedural team, escorted by Messrs. Sutton and Graham, of Atlas Constructors, checked the area time office warehouses and records, general time office and records, payroll office and records, general administrative office and records, relating to equipment, labor costs, accounting, and personnel.

August 4, 1952—Sidi Slimane.—The operational team, in the company of Lieutenant Colonel Koch and Lieutenant Colonel Henderson, Corps of Engineers, Messrs. Porter and Merrill of PUSOM, Messrs. Mills, Wilbur, and Teters of Atlas Constructors, Lieutenant Colonel Banta, area commander, and Mr. Kelly, project manager for Atlas Constructors, inspected the runway, taxiways, aprons, gravel pit and gravel processing plants, asphalt plant, crushing and screening plant, sewage disposal plant, soil laboratory and records of tests, construction camp, recreational facilities, family quarters and the dining hall.

The procedural team, accompanied by Mr. Merkt of Atlas Constructors, inspected the area time office and its records, the general time office and its records, the payroll office and its records, warehouses and property records, the general administrative office and records of personnel, equipment, labor costs, and general accounting.

August 5, 1952—Casablanca.—The operational team, in the company of Lieutenant Colonel Henderson, Corps of Engineers, inspected the dock facilities, material-in-transit facilities and warehouses.

The operational team conferred concerning the testing procedures and operations of the testing laboratory inspected prior to this date.

The procedural team checked the office and records of the Comptroller and the functions of the General Office Services Section.

August 6, 1952—Nouasseur.—The operational team inspected the storage areas, warehouses, repair shops, taxiways, and aprons.

The procedural team checked the personnel office and records, general accounting office and records, and cost accounting office and records.

A critique was held by the survey group relating to progress to date and the need for further information and data.

August 7, 1952—Nouasseur.—A conference between the operational and procedural teams of the survey group was held at Nouasseur.

A conference was held with Messrs. Mills, Wilbur, and McClary of Atlas Constructors concerning the working relationship and cooperation between the different principals. In addition, the following subjects were discussed: costs, available construction moneys, flow of plans and specifications, surpluses, and the pavement revaluations program.

The procedural team again inspected the general accounting office and its records and the purchasing office and its records.

August 8, 1952—Boulhaut-Nouasseur-Casablanca.—The operational team, escorted by Lieutenant Colonel Robertson, Corps of Engineers, inspected the site of the Boulhaut base. After returning from the Boulhaut site the operational team interviewed Mr. L. E. Bozarth, district principal civilian engineer, concerning the tests and anticipated corrective measures on the aprons, taxi-ways, and runways at the Nouasseur and Sidi Slimane bases.

The procedural team checked the Casablanca purchasing office and records, the Casablanca perishable food storage facilities and records, and the payroll office at Nouasseur.

August 9, 1952—Casablanca.—The operational team interviewed Colonel Barnett, Air Force liaison officer. During the interview matters relating to his general activities and responsibilities were discussed. The tests, inspections, and proposed remedial measures concerning the Nouasseur and Sidi Slimane pavement surfaces were discussed.

The procedural team interviewed the heads of the following departments of the Corps of Engineers, division office, at Casablanca: management, fiscal, supply, and property.

August 10, 1952—Casablanca.—A conference of the survey group was held to determine the progress of the survey to date and to draft an agenda for a combined All Principals Conference to be held August 11, 1952.

August 11, 1952—Nouasseur.—A general conference was held at the district engineer's office with the following representatives present: Division engineer, the district engineer and staff, Atlas Constructors, PUSOM, and the Air Force liaison officer. Pertinent discussion was entered into concerning general matters.

The operational team also inspected the base at Nouasseur while the procedural team interviewed the heads of the fiscal, management, supply, and property departments of the district office, Corps of Engineers. In addition, the property and accounting records were examined at the Nouasseur base.

August 12, 1952—Sidi Slimane—.One member of the operational team went to Nouasseur, planning to fly to Sidi Slimane for the purpose of observing test operations with the 200-ton roller. The flight was canceled when advised that the 200-ton roller was being repaired.

The procedural team interviewed the area auditor of the Army Audit Section and checked personnel records of Atlas Constructors.

August 13 and 14, 1952—Casablanca.—The survey group occupied these 2 days compiling, editing, and briefing data and information preparatory to drafting the report of the survey.

General Survey of Project

CONSTRUCTION OPERATIONS

Transportation and storage

Transportation.—Equipment, materials, and commodities purchased in the United States are consigned to Claremont Terminal, N. J. At this location the unloading, storing, checking, recording, preparation, and reloading for overseas shipment are performed. The actual physical operations are performed by an independent stevedoring contractor under the direction of the Army Transportation Corps.

As Atlas Constructors have no operational responsibility for Claremont Terminal, no detailed appraisal was attempted concerning the efficiency of the terminal. The general lay-out of the terminal should permit efficient handling. The storage areas, warehouses, and docks were in excellent order, appeared workways and the operations were judged to be under competent direction. Representatives of Atlas Constructors advised that the terminal was servicing their needs satisfactorily.

The equipment, materials, and commodities arriving by vessel at Casablanca Harbor are unloaded directly onto Atlas Constructors' transportation units. This efficient operation was the result of favorable negotiations with the French port authorities. One rehandling operation generally required in ship-unloading operations is eliminated.

The dockside operation is under the supervision of Atlas Constructors, Mr. Manning in charge. The operations definitely indicate Mr. Manning to be an able person with the requisite experience for this type operation.

Storage.—The materials, equipment, and supplies are transported from dockside to MITA (material-in-transit area) located in Casablanca. MITA is in effect a clearinghouse operation. Incoming shipments are identified, checked, and classified at this location.

To expedite and eliminate rehandling, bulk materials are generally transported directly from dockside to project site. The operation of MITA appears most effective. This operation has been functioning approximately 4 months. The open-storage areas and warehouses are adequate, accessible, and orderly. The entire area has proper security.

Perishable foodstuffs and commissary supplies are stored in warehouses located in Casablanca, from which they are transported direct to the project sites. The warehouses and storage areas are orderly and clean and perishables are under proper refrigeration. The stocks are identified by stock cards upon which are recorded receipts and disbursements. Stock records are in order, current, and adequate. It was evident that a physical count was taken on a 4-week cycle.

Central storage area.—A central storage facility is now being established at Nouasseur. Upon completion it will be the base facility for storage and warehousing operations. Previously the warehouses had been at scattered locations in Casablanca. The warehouses at Nouaseur had been in operation for only 2 months. Therefore, the warehousing operation was in the process of being organized. It is estimated that approximately 60 days will be required to bring this operation to the standard required by the management. At the end of this transition period the warehousing facilities should be ample for the operations.

Project storage areas.—Project storage facilities at the various construction sites are adequate and orderly. The warehousing operations are arranged for proper handling. All bins are identified with stock cards except for the project warehouse at Sidi Slimane. The warehousing operation at that location is in a transition stage, with materials in the process of rearrangement.

Transportation and housing of personnel

Transportation.—Transocean: The majority of personnel recruited in the United States and Europe are transported to Casablanca by air. At the terminal

tion of their employment they are returned to their point of hire by air transportation. Military Air Transport is utilized whenever available.

Local: The transportation of the native workmen from the towns and villages to the work sites is handled by motor vehicles operated by Atlas Constructors or the special trains operated by a French Moroccan common carrier.

Transportation within the project areas is handled by motor vehicles under the operation of Atlas Constructors.

Housing.—Only American and European employees are housed on the project sites. The housing consists mainly of single- or multiple-unit prefabricated buildings and tents. The lay-out of the housing areas are orderly. Sanitation and maintenance are proper.

At the Ben Geuerir Base the capacity of the construction camp, including recreational and commissary facilities, are approximately double that required for the contractor's present forces. The design of these buildings is equivalent to the 10-year specification of the Air Force. Negotiations are currently under way to transfer facilities and accommodations for approximately 1,000 men to the Air Force. The contractor's camps, warehouses, and shops for future bases are to be designed and so located that they may become a part of the permanent facilities of the Air Force Command.

The cafeterias and dining halls are all of good construction and properly equipped. They are well maintained and efficiently operated. The food is of good quality, well prepared, and appeared to be satisfactory from a dietary viewpoint.

Plant facilities

Aggregate production.—Suitable quarries and/or gravel deposits have been opened at each project site. The operations are properly equipped, satisfactorily organized and supervised by experienced superintendents.

Crushing and screening plants.—The crushing and screening plants produce materials for base courses and asphalt pavement. The plants are properly arranged as to the flow of materials, efficiently operated and well maintained.

The plant at Sidi Slimane was producing and stocking "special" aggregates. This material had been selected from the lower stratum of the deposit as this stratum was free of excessive clay. It is anticipated that this material will be used for corrective measures on certain parts of the aprons, taxiways, and runways.

Asphalt plants.—Asphalt plants appear to be well situated in relation to the work, properly arranged, and in good operating condition. A second asphalt plant is now being assembled for operations at the Benguérir base.

Concrete block plants.—The concrete block plants are of the latest design and produce an excellent product. Due to changes in plans and specifications these plants have a capacity above the present project requirements.

Equipment and maintenance

Maintenance and storage.—Each project site is adequately equipped with shops and storage areas for equipment maintenance, minor repair, and storage.

Central maintenance base.—A central repair facility is being established at the Nouasseur Base for the purpose of major repair and overhaul of equipment of all bases. The shops have been completed only a short time, approximately 3 weeks. This facility will require approximately 60 days to complete. Previously repair shops, 11 in number, had been located throughout Casablanca.

POL system

The POL system located in off-base areas is being constructed by a syndicate of French and Moroccan contractors under the direction of the Corps of Engineers. Under this operational arrangement Atlas Constructors supplies 50 experienced welders, certain items of pipeline construction equipment, repair parts and pipe without cost to the syndicate. The system when completed will involve approximately 300 miles of pipeline.

Boulhaut Base

No current construction operations were in progress at this base. However, as operations were expected to be started in the near future, the operational team was escorted by Lieutenant Colonel Robertson, Corps of Engineers, and Mr. Mills of Atlas Constructors to the proposed site of operations. Lieutenant Colonel Robertson indicated several soil test strips that had been constucted, using shale from the site and sandstone obtained from a quarry approximately 3 miles west of the center line of the proposed runway. A pilot crusher plant had been set

up to reduce shale and sandstone. This plant was for research and is still in place. We then proceeded to the runway and examined two test pits approximately 2 feet deep. The top 12 inches was a very light topsoil and the bottom 12 inches was a type of marl impregnated with "buckshot" stone. Lieutenant Colonel Robertson pointed out several guyas, which are large depressions having no drainage outlets except through seepage. At the time of the inspection the guyas were dry but we were informed that they fill with water during the rainy season (October to May) and remain full until late May. The average annual rainfall was stated to be 28 inches in this locality. We then proceeded to the sandstone quarry site and were advised that sufficient quantities of material were available and that the quality of the material is deemed acceptable for "select" borrow. Lieutenant Colonel Robertson indicated the power lines and roadway which would have to be relocated in the construction of the Boulhaut Base.

The rock quarry site located approximately 6 miles from the west end of the runway was inspected. It was stated that it will be required to build a haul road for the entire 6 miles.

The rights-of-way to sandstone and rock quarries and the quarry sites have not been secured. The relocation of utilities must be done by the French Commission.

Paving operations

Benguérir base.—At this site the operational team rode and walked over the aprons and runway and observed sections of the completed subbase, primer application and the binder course. Although the surface of the leveling course had a rather smooth finish, it was observed that no failures had occurred on a test section of the runway including the binder course, which had been subjected to 200 passes of the 200-ton roller.

Sidi Slimane base.—Inspections were made of the runway, taxiways, and aprons. The operational team was advised that several passes with the 100-ton roller had been made over the south end of the runway. We had hoped to observe this roller in operation; however, it was being repaired at that time.

Nouasseur base.—The operational team inspected the runway, taxiways and aprons and observed the placing of the base course, binder course and top asphalt course. The base material for the surface of the runway is placed on a sub grade composed of special borrow, a material locally called tufa. The thickness of the base and surface courses is 16 inches.

Operation of the 200-ton roller was observed on the north and south taxiways. It was stated that 7 passes of the 200-ton roller had been made over this entire taxiway system. The only noticeable irregularities of the surface were over areas where excavations had been made for duct lines.

An inspection was then made of the operational apron, one-third of which had been rolled with the 200-ton roller. Evidences of depression were frequent but no complete break through had been reported on this section of the apron.

TESTS AND REMEDIAL MEASURES

The tests and proposed remedial measures concerning the runway, taxiways, and aprons at Sidi Slimane and Nouasseur bases were extensively inspected and discussed by the survey group.

At Sidi Slimane base an inspection was made of the area of the taxiway which PUSOM had concluded to be deficient from cores and test pits. This area had been rolled with the 100-ton roller. The surface was slightly rough but no deficiencies existed that interfered with current flight operations.

It had been planned to observe test operations with the 200 roller on the Sidi Slimane base. However, a breakdown of the roller prevented this observation. An additional 200-ton roller had arrived but had not been placed in use prior to completion of the survey.

The records of tests made at the PUSOM soil laboratory were examined, as well as four or five cores which had been taken from the bituminous surface of the pavement. These cores indicated a lack of density, excessive irregularity on the bottom, and variations in thickness, as had been stated in the PUSOM report. The survey group participated in many discussions concerning the tests being made on the aprons, taxiways, and runways. The principals in these discussions were competent men of broad experience in the type of pavements being constructed.

An inspection of the operational apron at the Nouasseur base, one-third of which had been rolled with the 200-ton roller, was conducted. Evidence of

depressions were frequent; however, no complete break through had been reported. The take-off of a jet airplane was also observed. From this take-off there were evidences of slight streaks on the pavement surface from the jet blast and from the short turning of the aircraft. Such evidences can be observed regularly on all runways as a result of operation of jet aircraft.

Conference with district principal civilian engineer

On August 8 the operational team interviewed the district principal civilian engineer, Mr. L. E. Bozarth. The interview covered principally the tests being made and the corrective measures to be taken on the aprons, taxiways, and runways at Sidi Slimane and Nouasseur bases. Mr. Bozarth stated that he thought the core tests and test pits and the analysis of them were adequate to determine any deficiencies that might exist. He did not think that rolling with the 200-ton roller was necessary to determine deficiencies, but he added that he felt better satisfied after use of the 200-ton roller as a step in revaluation. He stated that he had full confidence in the ability of the technical forces now in the central offices at Nouasseur to pass on the tests and to make satisfactory and economical recommendations.

Conferences with Air Force liaison officer

On Saturday, August 9, the operational team interviewed Colonel Barnett, Air Force liaison officer for French Morocco and East Atlantic division. It was requested that he briefly state his activities and responsibilities. We were advised that he came to French Morocco on May 1, 1952. At that time Colonel Barnett proceeded to clear all questions directly through the district engineer, except that for urgent matters he at times went directly to PUSOM, in such instances he wrote a memorandum on the subject matter discussed with copies to PUSOM and the district engineer. We asked Colonel Barnett if he had a field inspection force. He advised that he has a representative at each of the three bases now under construction. He stated that in his inspection procedure whenever a deficiency is brought to his attention it is immediately settled by calling the matter to the attention of the inspector who had overlooked it. The tests that had been made at the Sidi Slimane and Nouaseur bases were then discussed. He said he is satisfied with the tests and further stated that he is not in favor of tearing up a lot of pavement nor does he favor the spending of large sums of money to correct the reported deficiencies.

Specifically, Colonel Barnett stated that in his opinion the south operational apron at the Nouaseur base could be used in its present condition by making some minor repairs in the worst spots and taking care of the drainage. The operational team was impressed with the frankness with which Colonel Barnett discussed his functions.

A general conference with the four principal agencies, Corps of Engineers, Air Force liaison officer, Atlas Constructors, and PUSOM, was held. From this conference it was ascertained that general agreement exists on the adequacy of the tests and the steps necessary to correct the deficiencies in the taxiways, aprons, and runways. Engineering studies by the principals are underway to determine the physical quantity of work involved in the proposed corrective measures.

ADMINISTRATIVE PROCEDURES AND CONTROLS

Survey of New York office

The survey of the New York office of Atlas Constructors was conducted from June 24 through June 26. A conference was immediately arranged with Lt. Col. R. O. Jernigin, district engineer, and Mr. L. R. Manning, business manager for Atlas Constructors. The purpose of the conference was to secure information on the interrelationship of the Corps of Engineers and Atlas Constructors and on general matters.

The working force in this office, numbering 115, appears full for the current workload. However, it was stated that the force had been substantially reduced recently due to curtailment in procurement and recruiting. A larger workload is anticipated in the near future when procurement and recruiting activities are resumed. Operating procedure manuals, recently revised, had not as yet been approved by the district engineer. It was understood that these procedures are established to conform to contract requirements, Technical Manual 14–1000, Armed Services Procurement Manual and the Manual for Administration of Cost-Plus-a-Fixed-Fee Construction Contract. The proposed procedures will provide satisfactory results. However, the same results could be secured with simplified procedures requiring less paper work.

The key positions in the New York office of Atlas Constructors are held by the following individuals:

L. R. Manning, business manager.
A. J. Kissinger, export manager.
John Langberg, purchasing agent.
W. W. Runge, comptroller.
T. A. Allen, project engineer.
A. B. Cooke, recruitment.
J. C. Chandler, personnel and time.
A. C. Mussy, transportation.
Philip Pearl, accounting.
T. P. Anderson, systems and procedures.
A. Sementa, travel.

Discussion with the afore-mentioned individuals indicated that they are experienced construction men and it was our considered opinion that they are capable.

The time and payroll functions are based on accepted standards. The staff is ample and the supervision appears qualified.

The Purchasing Department is operating under revised procedures conforming to Armed Services Procurement Regulations. Current operations in the Purchasing Department consist largely of issuing change orders to existing commitments because of a recent construction operation curtailment in French Morocco. All requisitions require Corps of Engineers approval prior to action by the Purchasing Department. All purchase orders must be approved in a similar manner prior to release to the vendor. The operating procedures and controls, although effective, are somewhat cumbersome. This Department is amply staffed with suitable personnel and supervised by an experienced head. The district engineer considers the purchasing agent competent and expressed satisfaction with the now existing conditions in this Department.

The Accounting Department is operating in conformance with revised procedures. The office arrangement and routine was orderly and the staff ample. No cost accounting operations are performed in the New York office. The comptroller and chief accountant are both proficient and experienced.

Recruiting and Export Departments had little activity and appeared to be on a standby basis. Supervisors in these departments appeared experienced.

Survey of French Morocco

The controls and procedures for all departments were thoroughly checked by the procedural team. The controls and procedures for central office and project offices are standardized and conform generally to the established operating procedures. Recent revisions in the purchasing and property accounting procedures are not reflected in the procedure manuals. However, current practices have tentative approval of the district engineer.

Personnel.—This department compiles a comprehensive record of all American personnel and adequate records of European and local personnel. The office arrangement and flow of work appear orderly. The staff is ample.

Time keeping.—The "brass system" is used. Each employee draws his brass at a designated area when checking in and deposits the brass when checking out. This forms the basis for determining each employee's time. In addition to the check in and check out, field checks are performed twice in each shift by a separate department. The time checkers, therefore, physically field check each employee drawing "brass" at least once during each shift. The shift checks are from 80 to 95 percent complete. Time is also verified and reconciled with the foreman's daily time cards. This system is widely employed and currently in general use on construction projects. The system has the approval of both the Corps of Engineers and the Army Audit Section.

Payroll.—The Payroll Department receives the reports showing individual and total shift hours from the Timekeeping Department. The time reports are processed in accordance with procedures which are adequate and suitable for the operation. The arrangement of the office and the flow of work conform to sound practice. This Department appears capably managed and amply staffed.

General accounting.—The system is adequate and has been approved by the Army Audit Section. It does not, however, provide cost controls for the various projects of the contract or inventory accounts; the cost accounting system provides these cost and inventory controls. The office is orderly and is amply staffed. The supervisor is experienced.

Cost accounting.—Labor costs are determined from the foreman's daily time cards, using average hourly rates determined for each payroll period.

Equipment costs are calculated on hours of use at predetermined hourly use rates.

Material and other costs are charged from accounting vouchers, with large amounts allocated to inventories and clearing accounts. The inventories and

clearing accounts are cleared by vouchers prepared from information furnished by the Cost Engineering Section following an in-place survey of materials.

There is grave doubt about the accuracy and currency of project costs and inventory values from the use of this method. In-place surveys have lagged but are expected to be near current shortly. This method of costing inventory materials does not conform to generally accepted practice.

The supervisor of this Department appears competent and has an ample staff.

General Office Services Section

This section handles all office supplies, supervises a typing and translation pool, the maintenance of office equipment, and the distribution of personal and business mail for all projects. It is suitably organized and managed by a competent supervisor.

Purchasing Department

This Department operates in two sections, Casablanca local purchasing and multicontinent, which the present supervisor, having only been employed 7 weeks, is in process of reorganizing and consolidating into a single unit. Operations are in accordance with procedures, approved by the Corps of Engineers, requiring prior written approval of the Corps of Engineers on all requisitions and purchase orders. Procedures provide adequate controls but are unnecessarily restrictive as now practiced. Present practice is to secure sealed bids on all purchases over $50.

Procedures for local buying are materially different from those encountered elsewhere. In Casablanca the purchaser's representative calls on prospective sellers and solicits quotations which, when ready, are picked up at the seller's offices. The condition of organized sellers and other local customs might be conducive to collusion and kick-back but nothing was observed to indicate its existence. The purchasing agent is aware of this condition and expects to keep this part of his operation under control.

Property accounting

Records of this Division have never been audited due to incompleteness. Warehousing and storing operations are now being centralized. The new base for property accounting is expected to be the latest inventory taken June to July 1952 at all locations. Much energy is now being spent to bring the records of property units into working shape and to compile a catalog of unit prices. Various sources say it will be 60 days before these operations are complete. Present status of records makes it impossible to determine value of materials in inventory. Written operating procedures are to be prepared for consolidated operation. This operation now has the constant attention of top management.

General Observations

Personnel training

Atlas Constructors operate trade schools to instruct natives in the work of various crafts employed on the projects. Many natives who have finished the instruction courses are currently employed as carpenters, truck drivers, tractor operators, and mechanics. These natives are considered fully qualified and are at present doing an excellent job. The development of local labor into craftsmen results in considerable savings to the project.

Morale

In the conduct of the survey a sincere effort was made to confine the studies to current operations and to the circumstances affecting them. There was continuing evidence, however, that morale has been adversely affected. There is little doubt that causes for this condition existed to a considerable degree before the survey began. The unfavorable publicity and adverse criticism centered on this project in the past is the major contributing factor.

Those in direct control of the project are fully cognizant of both past and present conditions. They are making a determined effort to bring about a firm construction program which will keep all occupied to capacity and thus restore the high morale so essential to an efficient construction program.

Concluding Conference

Conference with representatives of principal agencies

On Monday, August 11, 1952, at 8:30 a. m., a meeting in Colonel Campbell's office was attended by General Walsh, Colonel Campbell and staff, Messrs. Mills, Wilbur, and Teters, of Atlas Constructors, Messrs. Porter and Porel, of PUSOM and Messrs. Maxon, Burke, Rowe, and Keenan of the survey group. Colonel Campbell opened the meeting by saying that it had been called at the request of Mr. Maxon. The opening statement by Mr. Maxon asked permission of General Walsh and Colonel Campbell to have answers as short as possible, "Yes" or "No," if appropriate.

Question.—Is flow of funds adequate to support an orderly construction program of this magnitude? General Walsh answered "Obviously no."

Colonel Campbell explained that certain funds, even though appropriated by Congress had not been made available for construction.

Colonel Barnett thought that funds were sufficient but not after the "snowball program" came up. To a question by Mr. Maxon, Colonel Barnett explained the "snowball program" by saying the 1953 appropriation was only 45 percent of the Air Force request, therefore it was necessary to review all Air Force construction planning and to determine just what could be built in the over-all program with the reduced funds. Colonel Barnett further stated that in about 3 weeks there would be information on the program for French Morocco as well as allocation of funds from the 1953 appropriations.

General Walsh added that he had attended a conference in Washington and had been assured of at least $38,000,000 for French Morocco from the 1953 funds.

Question.—Are the flow of plans and specifications adequate for support of an orderly construction program?

Colonel Campbell said "Yes" for short-term planning but "No" for long-term planning.

Mr. Porel, of PUSOM, said they received their information for planning on a short-term basis, then added that their planning was further complicated by the "three continent" purchasing plan, which requires specifications to be prepared for differing materials on each continent.

Question.—Do you consider the present construction plant and maintenance facilities adequate for this program?

Mr. Wilbur, of Atlas Constructors, answered "Yes" with exception of large crushing equipment that would be needed at the Boulhaut Base. Mr. Teters, of Atlas Constructors, remarked that much of the equipment had worked up to 6,000 hours and generally at this point replacement might be cheaper than repairs.

Question.—Do you consider your present personnel adequate for this program with respect to both numbers and qualifications?

Colonel Campbell stated that he needed personnel for technical review.

Atlas Constructors stated they fear a general exodus at the end of the 510-day period (that is, income-tax relief granted to persons living in a foreign country for 510 days out of 18 months). PUSOM concurred.

Atlas Constructors and PUSOM are in agreement on the need for an incentive program. Mr. Porel estimated a 25-percent loss of employees at the end of the 510-day period unless such a program is established.

General Walsh observed that proposed airfield work in Europe will be a magnet for all classes of employees.

Dissatisfaction is expressed by Atlas Constructors because of a change of termination policy.

Question.—Do you believe that present surpluses of material and equipment in excess of those needed for the current program will be consumed in a subsequent program in this district?

From discussion it was understood that all surpluses are considered usable in French Morocco except perhaps lumber and 6-inch and 8-inch pipeline materials. Colonel Campbell said there is no plan under way to dispose of surpluses.

Question.—Do you expect to be able to secure the total value of inventories from the property records? Answered "Yes."

Question.—How long will it be before you are in position to reconcile property-inventory value with value shown on the accounting books? Answer: About 60 days.

Tests and corrective measures now under way at Sidi Slimane and Nouasseur have been extensively inspected by the survey group. We would, therefore, like to ask several questions.

Question.—Are the tests being conducted, in your judgment, adequate to determine steps necessary to perfect these runways, taxiways, and aprons? There was affirmative agreement on this question.

Question.—Have you arrived at a decision as to the corrective measures to be taken? There was general affirmative agreement on this question.

Question.—Have you, from such decisions, arrived at an estimate of the quantity of physical work involved? All agencies agreed that an estimate would be available in the near future.

Question.—Do you have a progress-control committee consisting of top-echelon representatives of each agency?

Colonel Campbell answered "Yes." It meets every Tuesday and has proven valuable. This control committee was established March 1, 1952.

Mr. Maxon stated: "This completes the questions. The survey group wishes to thank you for your full cooperation."

Mr. DONNELLY. It may facilitate things, Mr. Maxon, if I would briefly state what your group did.

There are a number of matters in your report which I believe our committee will desire to explore further.

May I ask you first the nature of the request made of you by the Secretary of the Army which resulted in this survey?

Mr. MAXON. I think that is pretty well answered here in the report by the statement of the scope of the survey and its purpose, appearing on page 1. Perhaps copies of this report are not in the hands of the others here who might be interested. We have no additional copies, I am sorry. We are deficient in that respect.

Mr. DONNELLY. I did not feel free to release copies to anyone since you have filed the report with the Secretary of the Army.

Mr. Bishop has run off a number of copies and I believe that we have a supply here. Is it the wish of the Secretary of the Army, Mr. Bishop, that copies of the Maxon report be made available at this time to the Atlas Constructors and the Corps of Engineers and others?

Mr. BISHOP. We certainly have no opposition to letting those copies out.

Mr. DONNELLY. Yesterday, as I understand, you furnished copies to the general counsel of the Air Force.

Mr. BISHOP. That is correct.

Mr. DONNELLY. So that would leave Atlas without copies. I observe, Mr. Maxon, that copies of the report are now being obtained and will be furnished to Atlas.

Mr. MAXON. Thank you, Mr. Donnelly.

Mr. DONNELLY. On page 1 of the report you state the purpose of the survey was—

> to examine the situation in French Morocco and in the United States and to render an independent and unbiased report on the current status of operations.

Then you state the scope of the report in subparagraphs (*a*) through (*f*).

Then, on pages 2 and 3 you list the personnel who participated. I note this statement:

> The members of the survey group have broad experience, both within the without the continental limits of the United States, in construction operations of the type surveyed. They are all currently and actively engaged in construction as a life work.

Mr. MAXON. That is correct.

Mr. DONNELLY. In your opinion the members of your survey group, then, were highly competent professional men, well versed in the field of heavy construction?

Mr. MAXON. I personally selected them with that in view.

PURPOSE OF THE SURVEY

Mr. DONNELLY. Mr. Maxon, as I understand from your report, the survey was undertaken for the purpose of determining and ascertaining the status of the job, as to management, construction, policies, procedures, as of the time that your group made the study.

Mr. MAXON. Yes.

Mr. DONNELLY. In doing that was it the function of your group to go into past history and to evaluate the history of the job from its commencement in January 1951 until your group started its work?

Mr. MAXON. Only insofar as it might have some effect upon current operations.

Mr. DONNELLY. With respect to current operations, I note in this statement of the scope that part of your group's function was to determine any currently existing deficiencies or waste; to determine what steps are currently being taken to remedy any existing deficiencies; to determine, specifically, what steps are currently being taken in relation to the tests being conducted with respect to the runways, taxiways, and aprons at Nouasseur and Sidi Slimane bases; to determine whether the remedial steps being taken are sound and will assure that the project is completed in a workmanlike manner; to recommend any remedial action deemed necessary; and to determine the status of working relationship between the various principals involved.

With respect to those statements of function, let me ask you this: Was it true that your group concluded your survey on August 14 prior to the time that the results of the final tests—extensive tests of construction—had been completed and evaluated by those responsible?

Mr. MAXON. For all practical purposes, yes. Sectional parts of the tests had been completed.

Mr. DONNELLY. I understand from your report that you specifically did not undertake to evaluate the construction of pavements and other facilities because that evaluation would be subject to the receipt of final tests; is that correct?

Mr. MAXON. Yes. That evaluation was quite an extensive operation, sir. It required considerable personnel over a period of time to make proper engineering analyses and studies, and from those studies to arrive at an estimate of what was necessary as a corrective action. We did examine thoroughly into the method of making the tests, and as to the steps which were proposed for correction.

Mr. DONNELLY. Was your group satisfied with the competence of the personnel and the procedures being employed in the tests?

Mr. MAXON. Absolutely, sir.

Mr. DONNELLY. As shown by your report, your group made a survey in New York of all the operations there and also at the site in Morocco; is that correct?

Mr. MAXON. That is correct.

Mr. DONNELLY. And visited all the sites of construction in Morocco?

Mr. MAXON. Yes.

Mr. DONNELLY. Now, with respect to the construction on the sites in Morocco, I understand from your report that major work had been undertaken at three bases—Nouasseur, Sidi Slimane, and Benguérir.

Mr. MAXON. That is correct.

Mr. DONNELLY. Whereas, only engineering work, or primarily engineering work, had been done at Boulhaut and El Djema Sahim; is that correct?

Mr. MAXON. That is correct.

COMPETENCE AND ORGANIZATION OF VARIOUS CONSTRUCTION AGENCIES

Mr. DONNELLY. We will now turn to your first conclusion and recommendation; that is, conclusion A on page A. We find your conclusion with respect to the competence and organization of the various construction agencies involved on the job. Your conclusion stated here is:

> There exists in the central bases at Casablanca and Nouasseur and in each of the construction areas a competent and well-organized staff at top level of all management agencies.

Mr. MAXON. That is right.

Mr. DONNELLY. Now, in arriving at that conclusion did you give any consideration to the top-level management of the various agencies prior to the time that your group undertook its survey?

Mr. MAXON. No, sir.

ADEQUACY OF FLOW OF FUNDS TO SUPPORT EFFICIENCY OF OPERATION

Mr. DONNELLY. In the second paragraph of A there is this language:

It—

meaning management—

> has been handicapped at times by an intermittent flow of construction directive and by lack of funds. We recommended prompt action to provide construction authority and funds to support an orderly and continuous operation.

Would you care to particularize on this handicap of the flow of funds? Did it exist at the time that your group made its survey?

Mr. MAXON. I think the report covers the position there. In an organization or an operation as large as that one, one of the requirements of efficiency—and one of the top requirements—is a knowledge well in advance of the obligation required of the personnel in all agencies so that competent management can be planned and economical construction carried out. It was our understanding from all parties concerned that at times they had run out of funds on the work. At the current time, during our operation, there was approximately $12,000,000 available to them for construction with a payroll of about $3,000,000 a month. You can see that they would be in a position of facing commitments for which there were no funds available. We also understood that additional funds had been made available by the Congress but had not yet been definitely allocated to the contractor for his operations.

Mr. DONNELLY. On page 14 of your report you refer to the funding status and state:

> It was stated that the total work assigned to the Atlas Contractors represented approximately $300,000,000, for the prosecution of which they had been allocated $201,000,000. Of this amount $189,000,000 had been expended or committed.

Then you state:

> There is an uncommitted amount of $12,000,000. The estimated payroll is $3,000,000 per month.

Did your group find that there were any orders for material, construction equipment, and the like, outstanding for which funds, in addition to the payrolls, would be needed to meet the orders?

Mr. MAXON. Within the $189,000,000 there was an estimate to cover those commitments.

Mr. DONNELLY. You speak of the estimated payrolls at $3,000,000 per month. That would be one phase of the operation. Did your group take into consideration the procurement pipelines? In other words, did they have orders in for materials and equipment for which they would have needed money, or did need money, in addition to the $3,000,000 a month?

Mr. MAXON. Do you mean did these figures take into account——

Mr. DONNELLY. The $3,000,000 a month for payroll obviously did not, but was there a further figure for procurement?

Mr. MAXON. It did not take into account any future obligations for either local or overseas procurement.

Mr. DONNELLY. Now we find on this point at the concluding conference, as shown on page 51, that the Maxon group asked this question:

> Is the flow of funds adequate to support an orderly construction program of this magnitude?
>
> General Walsh answered: "Obviously no."
>
> Colonel Campbell (the district engineer) explained that certain funds, even though appropriated by Congress, had not been made available for construction.
>
> Colonel Barnett (of the Air Force) thought funds were sufficient but not after the "snowball program" came up.
>
> To a question by Mr. Maxon, Colonel Barnett explained the "snowball program" by saying the 1953 appropriation was only 45 percent of the Air Force request, therefore, it was necessary to review all Air Force construction planning and to determine just what could be built in the over-all program with reduced funds. Colonel Barnett further stated that in about 3 weeks there would be information on the program for French Morocco as well as allocation of funds from the 1953 appropriation.
>
> General Walsh added that he had attended the conference at Washington and had been assured of at least $38,000,000 for French Morocco from the 1953 funds.

Now, I would like to ask, if I may, as of the time that your group made its survey, did your group find, or feel that the job was then suffering from a lack of flow of funds.

Mr. MAXON. As to the actual construction in the field, no; but as to future planning, the authority to plan and move so as to be ready for future construction; yes.

Mr. DONNELLY. Mr. Maxon, in a job of this nature some 3,000 miles from continental United States in a foreign country, would it be desirable and even necessary that the funding be provided on a basis longer in scope and anticipating more of the requirements than a comparable job within the continental United States?

Mr. MAXON. Oh, yes; by all means.

Mr. DONNELLY. Did your group feel that sufficient attention had been given to this problem of providing long-range funding to continue the operation beyond the current week, or the current month?

Mr. MAXON. We sensed that that knowledge was current with all of the staff with whom we discussed the problem. Your question asked whether or not sufficient attention had been given to it. I do

not believe that we went into the matter to also analyze whether or not attention was sufficient. There was full knowledge in the hands of competent people on that question, and we would naturally assume if competent people had that degree of knowledge they would give proper attention to it.

Mr. DONNELLY. Did your survey take into account the planning done here in Washington by the Air Force in the matter of fundir g this job?

Mr. MAXON. No, sir.

Mr. DONNELLY. You speak of money available for current construction operations. Do you mean that that would be money available for the three sites, Nouasseur, Sidi Slimane, and Benguérir, or do you mean that that would include those three sites plus the other two for which construction has been directed and is contemplated?

Mr. MAXON. We did not analyze it to that extent, to be able to answer that. We assumed that the directive for the use of the funds was beyond the scope of our power.

HANDICAP BECAUSE OF INTERMITTENT FLOW OF CONSTRUCTION DIRECTIVES

Mr. DONNELLY. Further in that conclusion (A) there is a reference to a handicap by intermittent flow of construction directives; and I find on page 52 a question which your group propounded at the closing conference, as follows:

> Are the flow of plans and specifications adequate for support of an orderly construction program?
>
> Colonel Campbell (the district engineer) said "Yes" for short-term planning but "No" for long-term planning.
>
> Mr. Porel, of PUSOM, said they received their information for planning on a short-term basis, then added that their planning was further complicated by the "three-continent" purchasing plan, which requires specifications to be prepared for differing materials on each continent.

This, at the time that your group was there, was some 18 months old as I believe the records show. Did your group determine what the district engineer meant by short-term planning as distinguished from long-term planning?

Mr. MAXON. That is a rather hard thing to define. Short-term planning would perhaps cover that work which had been specifically directed, actual construction in the field. Long-term planning might cover or be considered to cover the over-all master planning for the entire area.

STATUS OF MASTER PLANS AND ADEQUACY OF PLANS AND SPECIFICATIONS FOR PROJECTS

Mr. DONNELLY. Mr. Maxon, did your group find that the master plans for each of these five bases are complete at this time or are incomplete?

Mr. MAXON. We found that there were master plans available. They had been frequently changed and whether or not they were the final ones available or subject to further change we did not know? I understand some of the master plans were at that time subject to question as to whether or not they covered the intention of the entire over-all planning.

Mr. DONNELLY. May I break the question down into the five bases. Did you make a determination as to Nouasseur?

Mr. MAXON. In particular, no—just a minute. I would like to refer that question either to Mr. Rowe or Mr. Keenan.

He says the answer is correct—no.

Mr. DONNELLY. When your survey group visited these sites and had your conferences with the Air Force representatives, did the survey group seek to examine the Air Force master plan for these various bases?

Mr. MAXON. Yes; we were shown some of them.

Mr. DONNELLY. Was the discussion with respect to the completeness of the plans?

Mr. MAXON. You say completeness?

Mr. DONNELLY. Yes; whether the master plan, for example, for Nouasseur which has been under construction since April 1951 had been completed—had been formulated and made complete?

Mr. MAXON. I think we will have to explain that in this way, that although a master plan was available, it was understood not to be the final master plan.

Mr. DONNELLY. Mr. Maxon, did your group discuss with the Air Force or with the Corps of Engineers or both the question of whether, after some 81 months, the master plan appeared to be subject to revision and was not finalized?

Mr. MAXON. In our discussions with personnel of the Corps of Engineers, and the Air Force liaison group, there was a definite understanding that the master plans as then prepared were subject to change or might be subject to change.

Mr. DONNELLY. Did your group take into consideration the question of whether contemplated changes in the master plans for the three bases under construction would interfere with the formulating of plans and specifications or with actual construction operations?

Mr. MAXON. We would assume and did assume that the lack of definite over-all planning would be a deterrent to long-term planning for construction. But with reference to the current construction, naturally that does not start until a plan is available. That makes up the piecemeal planning of the over-all plan.

Mr. DONNELLY. Did your group find on the three bases under construction that the contractor and the Corps of Engineers had been furnished adequate plans and specifications for the work currently under construction?

Mr. MAXON. The word "adequate" there, I think, was beyond the scope of our examination. The plans and specifications naturally had been furnished.

Mr. DONNELLY. As an experienced construction contractor, Mr. Maxon, if you had the job and you were on the site and had responsibility to build it, would you feel handicapped by the failure to formulate and finalize a master plan for any one of these three bases under construction?

Mr. MAXON. I would feel somewhat frustrated; yes, sir.

Mr. DONNELLY. Did you find a feeling of frustration in Morocco on the part of the contractor or others at the time your group was there?

Mr. MAXON. I think it had gone beyond the stage of frustration. I think it had advanced to a stage of determination to find out what there was ahead of them.

Mr. DONNELLY. Now, with the contractor and the corps having the job of building what the Air Force wanted and your group's function being to determine the current stage of management, organization and operations, did your group give close attention to the nature, sufficiency, and adequacy of the plans and specifications which were being given to the contractor to do the work at that time?

Mr. MAXON. I think we answered that, did we not? Or did I misunderstand the question?

Mr. DONNELLY. You had answered that, but I am trying to go a little deeper into the question, because that would seem to be, from the record as we have it here, a problem in the past—that is, the availability of plans and specifications.

Mr. MAXON. Plans and specifications were available for the work under way. There were frequent changes perhaps brought about by changing conditions that they met in the field. That was an operational matter.

Mr. DONNELLY. Changes in the field to meet conditions found as the work progressed are not uncommon, are they?

Mr. MAXON. No; that is not at all uncommon.

Mr. DONNELLY. With respect to the plans and specifications for the work currently under construction, when you were there, did the plans and specifications consist simply of guideline specifications and an engineering manual or an Air Force manual? Or had they been developed to be adapted to the specific problems on these specific bases? Did you examine them and did you determine whether they were more elaborate, more adaptable to the job, than just guideline specifications, for example?

Mr. MAXON. I think the specifications as we examined them leaned more to the necessity of having them sound under current conditions, built around materials available in many instances. Let me elaborate on that statement. For instance, in the matter of construction, we mention a three-continent purchasing problem. Bids were taken in three continents simultaneously: in Europe, the United States, and Africa. Naturally, if economy dictated a purchase in Europe, the standards of manufacture in Europe would dictate the specifications, where the standard of manufacture in Africa or the United States might be different. That is what I mean by building specification requirements around availability of materials as dictated by the purchasing requirements. That is as to building construction.

On construction of runways, all materials do not break up and segregate in exactly the same manner. Natural materials found are not exactly the same. So it is necessary to build a specification for almost any flow of natural materials around the materials available at that location. So I think the general answer to your question is that the specifications were built specifically for that job.

Mr. DONNELLY. Was the building of those specifications an engineering problem to be resolved by competent engineers such as the architect-engineer and the corps, or was it a relatively simple thing?

Mr. MAXON. It was a continuous process requiring considerable competency as to experience and knowledge of materials.

Mr. DONNELLY. With respect, for example, to the two bases not under construction yet, Boulhaut and El Djema Sahim, would it be desirable from an engineering standpoint to do soil tests over a period

of 6 weeks or 2 months, prior to the time that plans and specifications for runway construction at those bases was formulated?

Mr. MAXON. It is desirable to have thorough tests of all the soil and materials available. As to your question about a period of 6 weeks or 2 months being desirable, that would depend upon the conditions and urgency at that particular time.

Mr. DONNELLY. Without pegging it to any particular period of weeks or months, is the problem of doing the soil tests before the formulation of specifications one that does entail a period of time of advance study?

Mr. MAXON. Oh, absolutely.

Mr. DONNELLY. And where the construction at the two crash bases, Nouasseur and Sidi Slimane, was done on the basis of planning and construction proceeding concurrently, which is the terminology of the Air Force directive of November 29, 1950, did the unavailability of time to do the advance soil and subsurface testing enter into the construction difficulties that attended those two bases?

Mr. MAXON. I do not see how it could avoid it. Specifically as to these particular bases we made no examination into that. It seems to us, as construction men, fundamental.

EFFECT OF INTERMITTENT FLOW OF CONSTRUCTION DIRECTIVES

Mr. DONNELLY. On this same theme, in your first conclusion and recommendation, you state, going back to it, that—

> It has been handicapped at times by an intermittent flow of construction directives * * *.

Would you amplify that statement?

Mr. MAXON. Well, a directive to proceed is necessary before a contractor can start. The owner must say, "There it is, it is ready to go." That is a directive to proceed. That directive might be for an over-all project or it might be for a part of a project and to provide competent planning there must be a constant flow of directives for construction.

Mr. DONNELLY. What does your group mean when you state here that management has been handicapped at times by an intermittent flow of construction directives.

Mr. MAXON. The directive for construction has not kept pace with the time period necessary for competent planning of the construction.

Mr. Chairman, Mr. Rowe has a thought here which might be helpful in clarifying that matter of being handicapped by lack of directive. May he make that statement, please?

Mr. RILEY. We should be glad to hear from Mr. Rowe at this time.

Mr. ROWE. Mr. Chairman, the handicap, from the constructor's standpoint is this. He has a large amount of equipment and a large personnel set up to do a certain volume of work and unless he gets the notice to proceed, which is the common term used, or the directive to proceed with the work, he naturally does not know what size organization or what materials he shall procure in order to proceed with the work. Delays in receiving the directives necessarily add considerable to the cost of doing the work, by reason of the fact that he is not going to send all of those American men home, because

naturally he has to hold onto his administrative organization knowing that finally a notice to proceed is going to come. It is a matter of meeting the plans and specifications which are issued on a short-term basis.

Mr. RILEY. Where you are operating that far from home it is necessary, is it not, to have these directives with more lead time than you would in operating within continental United States, where we are familiar with the lead time required and have access to the materials that you need and materials which are known. In other words, you would have to have a considerably longer lead time in these directives where you are operating three or four thousand miles away from home than you would here, in order to make your plans and test your materials and build your specifications around your materials; is that a correct conclusion?

Mr. MAXON. That is correct. That period might vary depending on the character of the materials or the transportation problems, storage problems, and things of that nature. But it does require a great deal more time and advance knowledge.

Mr. RILEY. Where these directives do not come out in time and come out, as you say, intermittently, there is bound to be a lag in the work with a consequent increase in cost; is that right?

Mr. MAXON. Or there must be a standing inventory wave of materials purchased by agreement and work designed about those available materials. Even then there is some delay.

Mr. RILEY. Where you have a large force of workers recruited, if you cannot adequately plan your work in advance, there is bound to be an inadequate result from your work force?

Mr. MAXON. I think you are correct.

Mr. RILEY. That even happens here at home.

Mr. MAXON. Yes; certainly.

Mr. RILEY. If you do not have your plans properly laid out and materials on the job.

Mr. MAXON. With the scarcity of materials in the last few years in this country it has been experienced on all the work; scarcity of materials and failure to deliver materials add to the cost.

Mr. RILEY. On a job of this kind away from home, you are not able as easily to turn your employees loose, if you run into an insufficient flow of materials; are you?

Mr. MAXON. There are two reasons for that. In the first place, you have to enter into a contract for a reasonable period to induce him to leave the States; and secondly there is the cost, which is a great deal, of getting him there and getting him home. Then he has to acquaint himself and accustom himself to conditions of the area and of the work. So that to let him go, to send him back home, would cost more money than it would to keep him there and it saves the replacement, the cost of acquiring and training the replacement.

Mr. RILEY. I am a little surprised personally to find that there is at this time still a lag in the time element of issuing these directives. I understand that your committee finds that is still an element at the present time; is that right?

Mr. MAXON. Not so much as to current work as it is to the planning of the two future bases which are not under construction.

Mr. RILEY. I see.

NEED FOR CONSTRUCTION AUTHORITY TO SUPPORT ORDERLY AND CONTINUOUS OPERATION

Mr. DONNELLY. Mr. Maxon, in your conclusion and recommendation A, you state:

> We recommend prompt action to provide construction authority and funds to support an orderly and continuous operation.

That would seem to indicate that construction authority is not present at the present time?

Mr. MAXON. We might possibly have used the word "authority" without due consideration from Mr. Webster. I would not want to attempt to say that that is the proper word to use. Naturally a construction contractor or those responsible for his operations must have some type of authority to plan constructively if there are not to be hampering delays and my use of the word "authority" there refers to that necessity.

Mr. DONNELLY. What action does your group feel should be taken to implement your recommendation?

Mr. MAXON. Definite determination of the volume of work that is going to be done. Advise the agencies there of the amount of that work and when a proper estimate of the funds necessary to support the time period required for the work is made, then supply the funds within the estimate of that time period.

Mr. DONNELLY. Did your group ascertain what agencies should make that determination?

Mr. MAXON. No, sir.

Mr. DONNELLY. With respect to the interrelationship of the various top-level agencies involved, did your group find that the Air Force was the agency that made the determination that you speak of, or would make it?

Mr. MAXON. No, sir; we did not go into that.

FULFILLMENT OF SPECIFICATION REQUIREMENTS AT SIDI SLIMANE AND NOUASSEUR

Mr. DONNELLY. Now, if we might pass to conclusion and recommendation B, you state:

> Pavements now being constructed appear to meet the requirements of the specifications and good construction procedure. Certain portions of the pavements previously constructed at Sidi Slimane and Nouasseur do not fully meet current specification requirements; * * *

If I may stop there: It states that certain portions of the pavements at those two bases do not fully meet current specification requirements. Did your group go into whether the pavement at those two bases at the time it was laid met the then specification requirements?

Mr. MAXON. No, sir.

Mr. DONNELLY. On this matter of tests and evaluations I stated at the outset that your group made this report subject to a later evaluation of the tests and your group did not undertake to reach any independent result as to the adequacy of the construction already laid; is that correct?

Mr. MAXON. That is correct.

CORDIAL WORKING RELATIONSHIP AT GROUP LEVELS

Mr. DONNELLY. In your conclusion C, your group finds that:

A sincere effort exists in all groups to coordinate the separate operations of each to produce an orderly and economical conversion of funds into facilities. There is a cordial working relationship at group levels interviewed.

In the record which this committee has, which has not been released to the public or to anyone else, and which is 655 pages long, there is extensive testimony on all phases of the job. There has been testimony by some that this was an unhappy job for the reason, among others, that there was not a feeling of cooperation, or an effort at cooperation between the various agencies involved; the contractors, the architect-engineer, the Air Force, and the Corps of Engineers.

From this conclusion C, I take it that your group found that as of this summer there was a sincere effort at all levels to cooperate?

Mr. MAXON. As of the period of our survey, yes; it was evident.

Mr. DONNELLY. Did your group come across any evidence of a past lack of cooperation among the prime agencies involved in the construction?

Mr. MAXON. "Evidence" is a broad word; hearsay might be better. There was hearsay that there had been in the past a disagreement in the various agencies. We did not attempt to go into that. In fact, we made an effort to close our mind to those things in the past, because that was not considered to be our charge.

Mr. DONNELLY. I would like, if I may, to pass to the problem of administration which appears on pages 40 and 41 of your report.

Mr. MAXON. With your permission I would like to ask Mr. Burke to answer those questions. He personally conducted that area of our survey.

Mr. RILEY. We would be happy to have Mr. Burke testify on that.

SIMPLIFICATION OF PROCEDURES

Mr. DONNELLY. Let me pinpoint, if I may, what I would like to inquire about. The statement is made at the bottom of page 40 as follows:

Operating procedure manuals, recently revised, had not as yet been approved by the district engineer. It was understood that these procedures are established to conform to contract requirements, Technical Manual 14-1600, Armed Services Procurement Manual, and the Manual for Administration of Cost-Plus-a-Fixed-Fee Construction Contract. The proposed procedures will provide satisfactory results. However, the same results could be secured with simplified procedures requiring less paper work.

Would you care to amplify the observation made here with respect to simplified procedures?

Mr. BURKE. Yes; in this respect. In accounting for public money, where you have public agencies auditing, they force you to do a lot of operations that we consider unnecessary. You can eliminate those and obtain the same results where you give to the contractor a little latitude in the establishment of the procedures.

(Statement off the record.)

Mr. DONNELLY. Coming back to the record, this committee has, since January of this year, been conducting hearings on the military construction performance of the Corps of Engineers and the Bureau

of Yards and Docks for the 14-month period from the outbreak in Korea in June of 1950 through August 31, 1951.

The problem that you make this observation about here, as to the administration of cost-plus-fixed-fee contracts, has cropped up on other contracts in other places. This observation of yours is not new. But since your group did make the survey, and you do feel that the procedure could be simplified, could you particularize so that those interested in the operation of these contracts could have the benefit of your group's recommendation?

Mr. BURKE. I unfortunately do not remember all the places where we thought they could cut down. But we judge by the number of people it took to do the job and the way they were doing it, that they just had too many people working. In the New York office I think they had 115 people and they had 3 people keeping the time and the time records. In my opinion that is 300 percent of what should be required for a payroll of 115 people. I would like to do that with one person.

Mr. DONNELLY. Did you attempt to determine why three people were necessary to do that particular job of timekeeping? Was it because the procedures, office procedures, were complicated—the records were complicated?

Mr. BURKE. Yes, I think the procedures and the records required were complicated and unnecessary. I thought it should have been done with a simplified set-up. I am not talking about timekeeping; I am talking about the associated records—leave and everything else that goes along with it. Whenever a person came in late, they had to make a special report and attach it to the payroll. We never do that in our work. If he is late, we just give him less time and that is the end of it.

Mr. DONNELLY. Does your observation go to the problem of procurement?

Mr. BURKE. Yes, we checked the procurement operation, too.

Mr. DONNELLY. Did you find that the procurement prodecure could be simplified?

Mr. BURKE. Yes, we thought that there was an unnecessary control over the procurement operation to start. We did not quarrel with that too much, because, in procuring with public funds, the contractor has to do some things that are a bit unnecessary where he has a fixed-price contract, in order to protect himself and the agency. We did not quarrel too much with that. We felt that the contractor was perhaps too tightly controlled and he might have a little more latitude to use his own judgment in some matters. But we did not quarrel too much with his procurement procedures.

NEED FOR SIMPLIFICATION OF PROCUREMENT AND OTHER PROCEDURES

Mr. DONNELLY. On procurement, on page 47, we find these three sentences:

> Operations are in accordance with procedures, approved by the Corps of Engineers, requiring prior written approval of the Corps of Engineers on all requisitions and purchase orders. Procedures provide adequate controls but are unnecessarily restrictive as now practiced. Present practice is to secure sealed bids on all purchases over $50.

Mr. BURKE. You are on Casablanca now. You are talking about the French Morocco set-up.

Mr. DONNELLY. These three sentences that I have read, do they apply to the New York procurement?

Mr. BURKE. New York does not have the same procurement set-up as French Morocco in that their procurement is mostly major. They do not do any $50 buying for job use. That is Casablanca buying. You are talking now about what they call local procurement over there.

Mr. DONNELLY. I did not mean to jump from New York to Morocco.

Mr. BURKE. That is what you did; you jumped to Morocco.

Mr. DONNELLY. Did you find in New York unnecessary restrictions on the procurement procedure?

Mr. BURKE. I thought that they were too tightly controlled; before the purchasing department took any action they had to get approval of the requisition by the district engineer. Then they went out and took bids and when they got the bids back, they took it to him again and got approval of the bids and authority to go ahead and make the purchase. We did not think that all that control was necessary. We think approval of the purchase before it is made is desirable to keep the agency informed. We think some latitude is better in the hands of the contractor, because you hire a specialist and you should give him some authority to go ahead and make purchases up to a sum without prior approval, for several reasons: To expedite your work, for one, and to simplify your procedures, and to move the work through faster.

Mr. DONNELLY. You say to get the work through faster. Let me ask you this: With respect to the lead time for procurement and the procurement pipeline for materials and equipment being purchased through the New York office, is that lead time being impaired or interferred with by restrictive purchasing procedures at the present time?

Mr. BURKE. Well, you are talking about New York only. New York is the slowest procurement office they have, according to the statements I got from the purchasing agent in Morocco. It takes longer for him to get bids through the New York office than it does through the Frankfurt office or the Casablanca office. The New York office requires more time and it takes longer to make the purchase because the Morocco office is always waiting for the advice from New York. Whether that is because of the mails or otherwise I am not sure.

Mr. DONNELLY. I do not know whether my question was clear or whether you have answered it. Are the present procurement procedures imposed or set up for the New York office restricted to the extent that they are impairing or retarding or interfering with the lead time for procurement of equipment and materials?

Mr. BURKE. They need not be. They could be worked so that they would not cause any delay.

Mr. DONNELLY. Did your group find any delay?

Mr. BURKE. No. We just found that the procedures were such that the purchasing department really could not move without running back and forth to the district engineer's office.

Mr. DONNELLY. Was there a dollar floor for competitive bids of $50 or $100 at New York?

Mr. BURKE. Well, the New York procurement is always major. We did not go into that.

Mr. DONNELLY. Was the New York office permitted to make any purchases without securing prior written approval of the district engineer?

Mr. BURKE. No. It is my understanding that they are required to have his approval on all purchase orders.

Mr. DONNELLY. Regardless of amount?

Mr. BURKE. Yes.

Mr. DONNELLY. Did your group find on that point that the district engineer in New York expedited or acted sufficiently quickly on approval of purchase orders?

Mr. BURKE. Yes; there seemed to be no complaint about slowness there.

Mr. DONNELLY. Now, with respect to New York procurement, you have spoken of excess personnel with respect to the timekeeping, as an illustration, and perhaps applying it to other areas.

Mr. BURKE. Yes.

Mr. DONNELLY. Let us go into procurement itself. You speak of simplified procedures requiring less paper work. In what sense now is the paper work excessive, and does that slow down the procurement?

Mr. BURKE. Well, we are talking about procedures in general, are we not, when we talk about less paper work?

Mr. DONNELLY. Your recommendation is on page 41.

Mr. BURKE. Yes.

Mr. DONNELLY. You indicate that that applied to New York.

Mr. BURKE. That is right. We found in some of the procedures there that there was an unnecessary amount of passing paper back and forth. We thought it could be reduced, if the procedures were simplified. I cannot illustrate each and every one of those, because I do not have the supporting papers with me. I illustrated one in the time office, and I think you will find that would be true in the purchasing controls and in the accounting controls.

Mr. DONNELLY. Now, with respect to this observation on page 41:

> However, the same results could be secured with simplified procedures requiring less paper work.

Does the Maxon group take into consideration the fact that in Government contracting there have to be more safeguards around the expenditure of public funds than you find in private industry, so that a greater amount of paper work and procedure normally is required? Was that a factor taken into consideration?

Mr. BURKE. We, who were there, think your audit section is so strict that the contractor has of necessity to go through more operations than good sense warrants in order to protect himself against disallowances of costs.

Mr. DONNELLY. Now, that is from the standpoint of the contractor. He wants to be reimbursed on a CPFF job for every dollar he spends. But how about the Government side of it? Did you take into consideration the necessary safeguards which would be required from the Government standpoint? Having taken that into consideration, do you still feel from a Government standpoint the procedure can be simplified?

Mr. BURKE. Very definitely so.

Mr. DONNELLY. With respect to that, sir, may I ask you this: Does the Maxon group desire or intend to elaborate and amplify this observation for the benefit of the Secretary of the Army so that it may be given consideration so far as procedure is concerned?

Mr. MAXON. We have not been asked to.

Mr. DONNELLY. The Secretary of the Army is represented here today by Mr. Bishop, the deputy counselor. Mr. Bishop, would you give that matter consideration on behalf of the Secretary?

Mr. BISHOP. I certainly will.

Mr. DONNELLY. Now may we go to the purchasing operation in Morocco, to which I have made reference previously, where you spoke of the sealed bids for everything over $50. That was on page 47.

With respect to Moroccan procurement and purchasing, the statement is made:

> Procedures provide adequate controls but are unnecessarily restrictive as now practiced. Present practice is to secure sealed bids on all purchases over $50.

Would you amplify on that, sir?

Mr. BURKE. Yes. I think that the purchasing department of a contractor ought to have latitude in two respects.

No. 1: I do not think he ought to be required to take three-continent bids where past experience has indicated he can buy best on one continent. He ought to be able to go there and make purchases based on prior experience.

No. 2: I think he ought to have latitude to buy up to certain sums without prior approval. For the contractor's own protection, he usually does get post approval of his actions. When you hire a specialist I think you ought to clothe him with enough authority to act without prior approval of every act.

Mr. DONNELLY. As I understood your statement, it breaks down into two components. One is the multicontinent purchasing system.

Mr. BURKE. Yes.

Mr. DONNELLY. Does that mean before procurement is made the prices in Europe, Africa, and the United States must be evaluated or studied?

Mr. BURKE. Yes. They take bids on three continents. They do not make any move until all the bids are received in Morocco.

Mr. DONNELLY. Does that interfere with or slow down the procurement which is necessary for the job? Does it interfere with orderly construction?

Mr. BURKE. Well, it means more lead time. It means more paper work. It just complicates what should be a simple job of going out and getting prices of commodities. Once you determine your markets, in my opinion, you ought not to worry about three continents. Once you determine the United States is better, or Europe is better, you ought to go direct, without the necessity of going to three continents on each and every bid or each and every requisition which you get.

Mr. DONNELLY. Did your group determine how long that three-continent purchasing system has been in effect? Does it go back to the start of the job?

Mr. BURKE. No; we did not go into that.

Mr. DONNELLY. Does anybody know the answer to that?

General WALSH. I do; yes, sir.

Mr. DONNELLY. General Walsh.

General WALSH. We have been making three-continent purchases right from the initial undertaking of the work. It was not done with simultaneous bids until I believe March of this year.

In addition, as we find that a particular market is consistently the low-bidding market, we then stop taking bids in the other areas.

For certain things, such as lumber, there is no competition anywhere except within the United States, so we make our lumber purchases from the United States sources. On some electrical and some plumbing and steel and cement work there is competition in all three places, so on that that type of material we take three-continent bids at the same time so there is no possibility of passing on information from one bid offering to another which might occur later. They all occur at the same hour, in Frankfort, in Nouasseur, and in New York.

Mr. DONNELLY. Is that currently interfering with or slowing down orderly construction in Morocco?

General WALSH. No; I feel that it is not. It is a slow procedure; I have to grant that; but I do not believe it is interfering.

Mr. DONNELLY. General, your direct responsibility there commenced early in 1952, as I remember it. You have indicated that that three-continent purchasing system was in effect from the beginning of the job. Do you know whether actually it was in effect in January, February, March, and April of 1951?

General WALSH. No. I am quite sure that practically all the purchases in those very early months were made in the United States and were primarily of equipment. As soon as the contractor had people on the site in French Morocco there were some local purchases. Very promptly after that they made some purchases in Europe.

Mr. DONNELLY. Colonel Derby, do you recall when that three-continent system was first put into effect?

Colonel DERBY. It did not get formally organized until the summer of 1951. In fact, we had not actually gotten the details of the system worked out until, as General Walsh said, early in 1952; but the Government agreement required that we not buy anything any place else than the local soil until we had made a determination that it could not be bought just as cheaply there as elsewhere, so we had to, as fast as we could progressively work into it, make such determinations.

In the early days of the job we went ahead and used our best judgment without making anything much of a survey in Europe. That business of making a European survey is right complicated. I think we opened a European purchasing office in September or October of 1951. Prior to that time we had just simply sent special purchasing missions up there whenever we thought some particular major purchase justified it.

Mr. DONNELLY. Colonel, did that three-continent system have any effect on the development and progress of the construction operations during 1951?

Colonel DERBY. In 1951? What little there was of it was beneficial, I would say that. We saved enough on cement alone in Europe to pay the whole payroll of the Frankfurt office there for a year or more.

Mr. DONNELLY. General Walsh, at the present time do you feel that this three-continent purchasing system is beneficial?

General WALSH. Yes, I do.

Mr. DONNELLY. Going back to the Maxon group, the other component of your answer was that the contractor should be given more latitude in purchases. Here on page 47 you refer to the requirement of sealed bids on all purchases over $50. Would you want to put a dollars ceiling on the amount of latitude which the contractor should be given?

Mr. BURKE. Yes; I think he ought to have a top limit he could buy with prior approval. I think taking sealed bids for a $50 purchase is really spending too much money to acquire the material. It costs money to take sealed bids and go through that formality on a job of this type. I think that on small purchases the contractor ought to be allowed to buy them without regard to formality.

Mr. DONNELLY. Now, would you want to suggest a dollars ceiling above the $50?

Mr. BURKE. I think the size of the job and the quantities of items to be purchased should dictate that. We have seen where it has been several thousand dollars, and we have seen where it has been less than that.

Certainly we should not take sealed bids for such small amounts as $50 or $100. Miscellaneous purchases should be bought somewhat informally by the contractor's organization without prior approval.

ACCURACY AND CURRENCY OF PROJECT COSTS AND INVENTORY VALUES

Mr. DONNELLY. Going into another area of your study, sir, we find on page 46 of the Maxon report the following statement:

> There is grave doubt about the accuracy and currency of project costs and inventory values from the use of this method. In-place surveys have lagged but are expected to be near current shortly. This method of costing inventory materials does not conform to generally accepted practice.

Would you want to elaborate on that?

Mr. BURKE. We are talking about the cost accounting and property accounting, which go hand in hand. The property accounting is not current. With property accounting not current the cost accounting—talking about materials only now—certainly is not in any better shape. They are in the process of getting their property records in shape. Until they are in shape their cost records will not be in shape.

I do not think that you can keep your cost records by costing your materials after an in-place survey. I think you are late, and I do not think you are accurate. I think they should be costed when the materials are issued from your inventory accounts.

Mr. DONNELLY. General Walsh, what is the status of that program to bring up to date and make current the costing of the inventory and the cost accounting of the construction?

General WALSH. That has been receiving the very close attention of the contractor, the district engineer, and my own office ever since last spring. A complete inventory of the central warehouse supplies was taken in January, and then again starting in May of this year they started a complete physical inventory at each of the projects and as well at the central warehouse, which had then been moved out to Nouasseur.

Prior to that time it had been scattered in a half dozen warehouses in Casablanca.

That has been completed, and separate property accounts have been set up for each of the individual bases.

Atlas Contractor, with the assistance of the district engineer, worked out detailed procedures to be followed on the completion of the physical inventory. The inventory was made with the assistance of property people from the district office, so that we would be sure of its completeness. We have kept at each project one or two property people, to be sure that the procedures which were agreed upon on requisitioning, issuing and accounting for property were followed out in complete detail. The district engineer now checks two or three times a month with the procedures to make sure that those procedures are currently being followed. The Army Audit Agency does likewise.

I feel that the property procedures now are good and from now on we should have complete knowledge of all receipts and issues and where those issues were made.

The final determination of the cost of all the property in the property account has not yet been completed. As you know, with many purchase orders at varying prices it is necessary to make a determination of what the average cost of various items in stock is. That is in process and will be completed, I would say, within 30 days now, judging from the last report I have had. When that is complete it will be possible to take off a cost value of materials from the inventory of stock on hand at the end of each month.

Mr. DONNELLY. Since you stated that the property control and cost accounting is now good, I would understand that heretofore it has not been good or has been weak or deficient in some respect. Does anyone in the Corps of Engineers want to comment on the condition of property control and cost accounting prior to the time that this present program was undertaken?

General WALSH. Yes; I would be happy to do that.

In the very early stages of the operation Atlas was permitted to have very few people sent to French Morocco. That was a limitation put on them by the French liaison mission. Procurement particularly of equipment had started in January in the United States.

Mr. DONNELLY. Of 1951?

General WALSH. Of 1951. Starting in February and during March and early April construction equipment and some materials started to be delivered to Atlas by shipload at Casablanca. Because of the very limited personnel available it was impracticable and impossible for Atlas to properly receive, inventory, and check the quantities and keep records of exactly what was received. It was not until after the 22d of April of 1951, as I recall it, that Atlas was permitted to start to bring in people in quantities. At that time the greatest urgency was placed on construction, to get operations going in the field. The principal effort of Atlas was to get construction personnel, and the procurement of property people and other administrative people lagged behind the procurement of construction personnel. I say primarily for that reason the property records and property accounting and cost keeping very definitely lagged behind the construction work.

Atlas recently has been endeavoring to get both their property and cost accounting procedures on a current basis. They have asked for and secured permission from the district engineer to get a group of special accountants to try to bring their property records up to date.

At the request of the district engineer and in accordance with the present desires of the resident partner, they have decentralized cost accounting from the central office to each project and are putting a cost engineer on each project, in order that costs can be on a current day-to-day basis instead of a month-to-month basis as they were in the early phases.

Although we are not completely satisfied with either property or cost accounting as it stands today, we feel that the steps which have been taken are going to give us an entirely satisfactory condition from now on.

Mr. DONNELLY. There have been charges made that there has been extensive loss of property and material and equipment on this job. In the previous hearings Atlas testified that in their reconstruction of property records and in tracing property they had been able as of the date of that hearing to account for 99 percent of all the property, material and equipment which had been procured and for which the Government was either to make payment or had made payment. Does your understanding coincide with that testimony?

General WALSH. Yes; it does.

Mr. DONNELLY. Further, the testimony on the part of Atlas was to the effect that 99 percent had been accounted for as of the date of that hearing but that did not indicate that there had been a loss of 1 percent—that the expectation was that at least a part, if not all, of the 1 percent of the property would be accounted for. Do you have any current understanding or knowledge about that?

General WALSH. I feel that the final accounting will indicate that the losses that occurred were not at all unusual. On any big construction job, whether it be lump sum, cost-plus-a-fixed fee, or what not, there is a certain amount of pilferage of small materials which people can pick up. There are small tools which employees walk off with. In French Morocco, because of the garb it is much easier to do that than it is in the United States, because they wear robes. There the small tools can be easily concealed.

But I feel that from the investigations and checks I have made the losses have not been abnormal, considering the size of the job and the speed with which the work was undertaken.

Mr. DONNELLY. Well, even considering those circumstances, have the losses through pilferage and other methods been extensive or large?

General WALSH. I do not feel that they have. I know that in some newspaper accounts, where specific items of relatively high value were reported to have been stolen, such as X-ray machines, they are completely untrue. There were two X-ray machines bought, and there are two X-ray machines there. That applies to a great many other items which have been commented upon.

Mr. DONNELLY. General, when do you anticipate that the property control accounts will be current?

General WALSH. My recollection is that the forecast on that is the 1st of November.

General NOLD. Mr. Chairman, I might add one feature, in view of counsel's query in respect to costing. Regardless of the merits of costing on an in-place basis versus an issue basis, in this case the property records had to be reconstructed and there was an attempt, therefore, to determine the materials which were in place as a part

of the inventory, such as lumber, steel and so on that had entered into the existing building.

Mr. DONNELLY. What effect, if any, does this difficulty of cost accounting have on such things as line item justifications, upon which further requests for funds are predicated?

General WALSH. The cost accounting is a tool to permit the engineer to make good estimates. The original estimates for a project such as this are based on usually world-wide experience for overseas jobs, and we take average costs and multiply them by some factor which is applicable to the area under consideration. It also, during construction, lets you know that you are building within the line-item amount which has been set up.

We require that a detailed cost estimate of each line item be made, and if it is equal to or less than the line-item amount then we proceed with it. If it exceeds the line-item amount by a sum less than 20 percent, before we undertake the work we procure the approval of the Air Force installations representative on the job. If it exceeds the line-item amount by 20 percent we report it to the Chief of Engineers. The Air Force reports it to Headquarters, USAF, and permission to proceed or instructions to defer that item are secured.

Mr. DONNELLY. That is at the present time?

General WALSH. That is at the present time.

Mr. DONNELLY. How about 1951?

General WALSH. In 1951 estimates prior to the initiation of individual line-item work could hardly be made with any degree of accuracy, because the entire scope of those line-item amounts was unknown. Procurement had not been initiated. Information on ocean freight and items of that character was not well established. Also, the scope of certain line items was not established.

For instance, take the runways at Nouasseur. They were authorized to be 9,000 feet long and 200 feet wide. The actual Air Force operational requirements set up the need for an 11,000 foot length of runway. So there we were exceeding the quantity which had originally been anticipated to be required; and that, of course, changed the cost of that particular item.

Also, prior to its initiation we were not sure just where the quarry would be. The location of the quarry and the type of material to be worked into aggregate will affect the cost. Therefore, in the early stages it was not possible to make detailed cost estimates prior to undertaking the line item amounts. That was due to the fact that the completion requirements were very, very stringent. The time for completion was very short.

DIMENSIONS OF NOUASSEUR AND SIDI SLIMANE RUNWAYS

Mr. DONNELLY. I have here the master plan for Nouasseur. It shows the primary runway. What are the dimensions of that runway, length, and width?

General WALSH. At Nouasseur it is 200 feet wide and 11,000 feet long.

Mr. RILEY. As completed?

General WALSH. That is completed; yes.

Mr. DONNELLY. What is the width of the taxiway?

General WALSH. Seventy-five feet.

Mr. DONNELLY. Is it the same length as the primary runway?

General WALSH. Yes.

Mr. DONNELLY. It is shown here on this plan as the same. At Sidi Slimane what is the length and width of the primary runway?

General WALSH. 200 feet wide by 11,000 feet long, and the parallel taxiway is of the same length. That is not true at Ben Guerir; that is 14,000 feet long by 200 feet wide, and the taxiway is not a parallel one. It goes in a very easy loop and is probably 15,000 feet long.

Mr. RILEY. Was the original plan to have that Ben Guerir runway 9,000 feet?

General WALSH. Originally that was the amount, yes.

Mr. RILEY. So that it is 5,000 feet longer than originally contemplated?

General WALSH. 5,000 feet longer, yes.

Mr. DONNELLY. Going back to the Maxon report, the report will be printed, and I haven't sought to go into each page and read the subject therein, but to pick out certain of the observations, conclusions, and recommendations by the Maxon group.

MORALE OF WORKERS IN MOROCCO

I would like to go to the Maxon group's recommendation on page 49 with respect to morale, and I would like to read that paragraph into the record:

> In the conduct of the survey a sincere effort was made to confine the studies to current operations and to the circumstances affecting them. There was continuing evidence, however, that morale has been adversely affected. There is little doubt that causes for this condition existed to a considerable degree before the survey began. The unfavorable publicity and adverse criticism centered on this project in the past is the major contributing factor.

Mr. Maxon, would you want to elaborate on this observation with respect to morale?

Mr. MAXON. I would like to make this statement regarding it: That question has to do currently with the people in the lower echelons of Atlas and of PUSOM.

Mr. RILEY. People where?

Mr. MAXON. In the lower echelons of the organization—those people you get in greatest numbers and who are the hardest to get in overseas work.

There is another paragraph in that statement that should be read with it.

Mr. DONNELLY. I will read it. I didn't mean to eliminate it:

> Those in direct control of the project are fully cognizant of both past and present conditions. They are making a determined effort to bring about a firm construction program which will keep all occupied to capacity and thus restore the high morale so essential to an efficient construction program.

Mr. MAXON. Yes, sir. That, in my mind, needs no elaboration, but in an effort to be helpful and to give you an understanding of what is in our minds, every man, whether he is a small man or a big man, has a certain pride in his work and the circumstances surrounding his work, and if he is overseas and the work in which he is engaged is subject to continual criticism, and his employer also is subject to criticism, there is a sort of an odor about the job, and too much of that, continuing over too long a period, lends to the job a questionable name.

People are reluctant to be connected with it because that history will last in the minds of the employees and in the minds of the people.

Those in the higher echelons understand that, and they do something about it, but the individual who works for a living—let's say he is going overseas on a job away from home because he wants two things: (1) the additional pay that comes to a man by reason of the fact he is away from home; and (2) he wants to have been connected with the largest successful operation. That goes down in the history of the man. When any of those things become questionable, he will look for another job, because he is a floating individual. A construction man is particularly susceptible to that influence. He is naturally shifted from place to place, and he looks for a job on which he can personally make a showing so that he can make a record, and when he goes to another contractor he will get a good report from his previous employer.

So I think the statement can be taken exactly as written, Mr. Chairman. To our minds, one of the most essential things for the successful operation of any construction job is the pride that the individual takes in the fact that he is doing a part of a job that is worth while, and that he himself will obtain some credit for a job that stands well in the public mind.

Mr. RILEY. I don't think, under the circumstances, a man in the lower echelons would take a great deal of pride in the fact he had been on the Morocco job.

Mr. MAXON. They are in the position of being in balance, I would say, from those we talked to. If they had a firm job they would forget the past and go to work.

Mr. DONNELLY. I find here, directly on this subject, on page 53, this question which your group propounded:

> Do you consider your present personnel adequate for this program with respect to both numbers and qualifications?
>
> Colonel Campbell stated that he needed personnel for technical review.
>
> Atlas Constructors stated they fear a general exodus at the end of the 510-day period (that is, income tax relief granted to persons living in a foreign country for 510 days out of 18 months). PUSOM concurred.
>
> Atlas Constructors and PUSOM are in agreement on the need for an incentive program. Mr. Porel estimated a 25-percent loss of employees at the end of the 510-day period unless such a program is established.
>
> General Walsh observed that proposed airfield work in Europe will be a magnet for all classes of employees.
>
> Dissatisfaction is expressed by Atlas Constructors because of a change of termination policy.

Do your observations with respect to morale among the workers over there have any bearing on this particular passage I have read from?

Mr. MAXON. You mean the passage you have read came from our observations on morale?

Mr. DONNELLY. Yes.

Mr. MAXON. Yes.

Mr. DONNELLY. Does your group know whether consideration has been given by top-level management in the Corps of Engineers and in the Air Force for the need for this incentive program to keep the people there?

Mr. MAXON. Oh, yes; we know that, and know that something is being done to work it out.

Mr. DONNELLY. Would it be costly to this Government, which is footing the bill, to have an exodus of as many as 25 percent of the employees, necessitating the recruiting and training of new employees to take their place?

Mr. MAXON. Most assuredly. Every time you bring a man from overseas the costs in transportation and time lost for which you have to pay him run up to $1,500, depending on the wage you pay him. Then you have to send him home. Then you have to get another one. Then you have to train that succeeding man. He has to fit into the organization. So that naturally the cost, although perhaps not definitely subject to precise determination, is there, and it is a very definite element which they are facing.

Mr. DONNELLY. Mr. Maxon, based on the world-wide construction experience of yourself and your colleagues, have you had experience in the past with the nature of such an incentive program?

Mr. MAXON. Yes; we have.

Mr. DONNELLY. What form has it taken in the past?

Mr. MAXON. Well, for renewal of an employment contract at the end of a contract period, sometimes a bonus is paid for the next year's employment, say an addition of 10 percent. Sometimes it takes the form of additional pay, or promotion of the man within the judgment of his employer as to whether or not he should be promoted. Sometimes you can employ a man at a higher salary, for instance, than the man you have on hand, and it would be to your advantage to promote the individual, and the judgment of the employer would say to promote that employee and increase his pay.

Those things are matters for determination by the contractor and by those directly responsible for his operations in a particular area. I think all construction men recognize those problems and would like to be able to settle them within the area involved.

QUALITY OF WORK ACCOMPLISHED

Mr. DONNELLY. Mr. Maxon, the committee understands, of course, that your group did not undertake to evaluate the quality of construction, but as experienced construction engineers and contractors, did your group form any impression as to whether the job that had been accomplished up to the time your group arrived in Morocco had, under all conditions and circumstances, been a good job, both as to scope and as to nature and as to quality, from your observation, or had it not?

Mr. MAXON. That work which we looked at as being currently done, we felt was excellent work and had been well managed.

Our visual inspection of the work which had been completed prior to our arrival there showed, from a visual inspection, no serious deficiencies that might not be found in any work done under the speed at which that was done. Since our charge was the present status of the work, we made no effort to go beyond a visual inspection of the past work, except as it referred to the tests being made on the runways which had been previously constructed, and on which there was general admission of knowledge among the personnel involved, some parts of which were not up to the current specifications.

So far as the appearance of the work, its general usability as it stood, it seemed good. Let's say that a visual inspection would not

determine, unless it was under constant use, what the probable life of the work was. There is deterioration on surfaces of such work by continual or occasional use, and that must be kept up by maintenance. So I don't think we are qualified, or attempted to qualify ourselves, on the character of the work which had been done.

Mr. DONNELLY. Mr. Maxon, keeping in mind your own reservation about arriving at any definite conclusion as to the work that was done there, could you give us the benefit of your own observation as an experienced contractor as to whether the amount of the work completed, under the limitations of the climate, under the limitations of the geographical area, working in a foreign country with the French having an interest in what was going on, the type of equipment that was available to do the work, the number of buildings and structures completed, the amount of pipework done, the amount of paving laid, and runways and the like, did you get any over-all impression that in sheer bulk the amount of work completed in the amount of time the corps had been there, was impressive? Did it appear to you to be a substantial accomplishment, or not?

Mr. MAXON. Absolutely so. A tremendous volume of work had been done.

Mr. DONNELLY. Did you form an impression that the tremendous amount of work that had been accomplished was in keeping with the amount of money that this Goverrment has paid for it, or did you get the impression that the cost of the amount of work that had been accomplished was excessive?

Mr. MAXON. We didn't extend our survey into the realm necessary to answer that question directly "Yes" or "No."

Mr. RILEY. Mr. Maxon, in your opinion, in the time that the work was under construction, keeping in mind the equipment and personnel available, do you think the amount of work accomplished shows up pretty well, taking those factors into consideration?

Mr. MAXON. Yes, sir; I do.

Mr. MCGRATH. We appreciate that you didn't go, in your survey, into the dollar value, and you have answered the question of counsel by saying you could not give a yes or no answer, but could you give your own best opinion as to whether you think the Government has received the dollar value for the work that has been done, or would you say we had paid an excessive price for the work that was done?

Mr. MAXON. Mr. McGrath, I would like to be helpful in that respect, but I don't believe there is any comparative measure available to any man unless he has had a similar operation under similar conditions. If you go out to buy something, the judgment of whether you are paying more or less than it is worth is a matter of comparison in your mind with what something similar is worth.

Mr. MCGRATH. And that is based upon your experience as to the fair and reasonable value of the article. Would you say the Government had paid a fair and reasonable value for this work, which you say was done in a good workmanlike manner?

Mr. MAXON. I might say I have no reason to think you paid an excessive value for it, but there is in my experience no comparative work to which I can point a finger and say, "This cost more or less."

Mr. MCGRATH. But you would be prepared to say, more or less, that this was not an excessive charge?

Mr. MAXON. That would be my personal judgment in the matter.

BACKGROUND OF MAXON GROUP

Mr. RILEY. Mr. Maxon, I wonder if you would mind giving the committee some of your background, the length of time that you have been in the contracting business, and some of the work that you have done, so that we might properly evaluate this testimony that you have given us.

Mr. MAXON. That is almost a story so long I am ashamed that I am still in it.

Mr. RILEY. Suppose you just hit some of the high points.

Mr. DAVIS. We should qualify this expert witness for the record, I believe.

Mr. MAXON. An expert is a man away from home.

I started in construction work when I was quite young, and I have been in it ever since. That construction experience started with a wheelbarrow and stout shoulders, and has extended on through an engineering education of sorts, construction work throughout the United States; perhaps I bid on more of it than I have had actual experience in. I worked some for the Corps of Engineers on locks and dams as an engineer; worked some for railroads as an engineer; worked some for General Electric as an engineer; and some for other private engineers.

Mr. RILEY. Do you mind giving us some of the contracts your company has constructed; just a few of them.

Mr. MAXON. I was a member of the National Contract Co. from 1913 to 1925. Then in 1928 I formed my present company from that organization.

We built quite a few dams on the Ohio River under the old company name. Maxon Construction Co. built several bridges and quite a few locks and dams on the upper Mississippi River, and was connected with bridges on the lower Mississippi River in an advisory capacity, and built quite a few in its own right.

During the war we built for the Navy two large ammunition depots; we were connected with the construction of shipyards and to some extent with the building of small river-type boats, oil barges, and so forth. Those operations during the war ran into, one of them, $70 million, and one in Nebraska approximately an equal amount.

Subsequent to the war we have been engaged in a good deal of work for the Atomic Energy Commission. Contracts there have run, I think the most recent one was stated in the press to be $464 million. That is a fee-type contract. Our actual obligation under that $464 million will probably not exceed $275 million, to be done in 2 years' time.

We are also currently engaged in a coventure on the island of Guam for the Bureau of Yards and Docks, Navy, with two other contractors. We are connected in that venture with the Pacific Bridge Co., of San Francisco, of which Mr. Keenan is vice president, and he is the manager of the coventure in the Pacific.

Mr. DONNELLY. Mr. Keenan is one of your group?

Mr. MAXON. Yes, chosen for his experience in overseas management.

That about completes the picture. We have built all types of public works, power plants, and so forth. We try to do a good job in what we do.

I would like at this time to evaluate the experience of Mr. Keenan and Mr. Rowe.

Mr. Keenan has been in heavy construction work all his life, connected with some of the largest bridges in the United States, in San Francisco Bay, in the Hawaiian Islands, and other Pacific islands, before and since the war.

Mr. Rowe has been engaged in highway and airport construction, and thoroughly understands that type of work.

Mr. Burke is treasurer of our company, and has been with us many years, in fact, prior to the formation of our present company. He has charge for our company of all procedural matters in regard to our work, and the flow of funds.

Mr. DONNELLY. Would you say that your operation is roughly comparable to some of the five coventurers in the Atlas Construction Co.?

Mr. MAXON. As to type, yes. So far as the Maxon Construction Co. is concerned, it has refrained from going into heavy earth-moving work. We have considered our operations more industrial, power plants and masonry type work. Other than that, I think the five members of that firm, as to type of work, would be comparable to ours. As to scope and volume, we have not attempted to equal M–K or some of the other firms.

Mr. RILEY. I believe it would be a fair statement, from what you have told us, that the members of your group would represent practically every type of work that is now done in Morocco?

Mr. MAXON. Yes, sir; including also the organization necessary to handle transportation and procurement problems.

Mr. Chairman, at this time I think I would like to make a general statement concerning a discussion of procedures in property and cost accounting. In my mind, as I listened to the testimony by Mr. Burke, General Walsh, and General Nold, I was not sure it was clear.

CURRENCY OF ACCOUNTING

Our survey, and our report, indicates clearly that current accounting is now current, if you understand what I mean. There is a cut-off date set here, past history, I believe in April, and from then on things are current. It is the tie-in with past construction and current accounting that is not at this time up to date, but everything seems to indicate that it will be within a short period of time.

Mr. RILEY. I am glad you clarified that, because it was not clear in my mind.

General Walsh, did I ask you how far back the current accounts are current?

General WALSH. We have been concentrating on making sure that our procedures and accounting were kept up to date since the inventory was taken last January. We have not put much time or effort on a reconstruction of the old records. We felt it was more important to keep current, rather than to spend the effort on the reconstruction of old records.

I would say that, in general, since the complete physical inventory taken in January, we have been improving very steadily in keeping our current records up to date, and as of today we are keeping right up to date with what happens on a day-to-day basis.

Mr. RILEY. In other words, would it be a fair statement to say that your accounts are current from the time the so-called crash program was ended and the regular procedures followed?

General WALSH. They have been kept up during that period. Some of the procedures, during January, February, March, the early portion of this year, were not such as to give 100 percent reliable records. But since May or June, when the new procedural set-up was established by the district engineer, those have been completely current.

Mr. MAXON. I have one more statement I would like to make, if it is permissible, Mr. Chairman.

Mr. RILEY. Yes, sir.

Mr. MAXON. There has been quite a discussion here as to the restrictive procedures, the extent of procedural methods, which may be too voluminous and which may hamper a contractor in using his experience and knowledge.

With General Walsh's permission, I would like to cite a conversation I had with him in that respect.

I asked General Walsh the question as to whether or not, as the development of this work progressed, it was his intention to remove gradually as many of those restrictive procedures as possible, and he said, "By all means"; that just as soon as he felt the past history was current and could be cleared in the record, it was his intention to turn the contractors loose and let them work.

General WALSH. That is a correct quotation.

May I add one other thing?

Mr. RILEY. Yes.

General WALSH. On the question of cost, we know what money has been spent and for what items it has been spent, but in the allocation of some of the costs of individual line items, we are behind in that. As to what we have spent and what it has been spent for, we are quite up to date.

Mr. RILEY. The committee will recess and come back at 5 minutes after 2.

AFTERNOON SESSION

Mr. RILEY. The committee will come to order. I will ask Mr. Donnelly to proceed.

BACKGROUND OF MR. ROWE

Mr. DONNELLY. Mr. Maxon, in giving the background of your experience of yourself and the other members of your survey group, you did give some of the background of Mr. Rowe. I wonder if Mr. Rowe would elaborate on that, having particularly in mind his experience in airfield and other paving construction.

Mr. ROWE. Like Mr. Maxon, I started in with a wheelbarrow in 1919. Since that time I have been engaged in building highways, airfields, a few dams, some railroad work, some bridges, but primarily my experience has been in the field of highways and airfields.

Although the fields in French Morocco are of a flexible type, so-called black top, my experience in airfield construction has been primarily with concrete rather than with black top. However, I have had considerable experience in the construction of bases similar to

those in French Morocco and that has extended over the years from 1919 up to the present time.

We have performed work for the State highway departments of Michigan, Pennsylvania, West Virginia, Indiana, Kansas, and Missouri, and we have likewise built some airfield facilities in most of those States.

Mr. RILEY. I wonder if you would mind mentioning a few of the airfields by name on which you have done some work.

Mr. ROWE. During the war we were in a joint venture at the Lockland Air Base at Columbus, Ohio, the Vandalia base at Dayton, Ohio, the Sedalia Air Base at Nobnostra, Mo., the Hays Field at Hays, Kans., and the Great Bend Field at Great Bend, Kans.

I would like to mention one other project, the Patterson Air Field runways at Dayton, Ohio. There was constructed there a runway with 21 inches of concrete and a taxiway with 25 inches of concrete. The runway is 300 feet wide and the taxiway 150 feet wide.

THICKNESSES OF PAVEMENTS AT NOUASSEUR AND SIDI SLIMANE

Mr. DONNELLY. I do not know whether you have considered this factor, or have any opinion of your own about it, but we find from the report of Mr. Porter of PUSOM that the proposed resurfacing will, with the existing asphalt binder and surface courses, provide 4 to 6 inches of bituminous base and pavement on the various aircraft areas at Nouasseur, and approximately 6½ inches of bituminous base pavement at Sidi Slimane. How does that contrast with the depth of binder and surface courses of the airfields that you have constructed for military use?

Mr. ROWE. Comparable.

Mr. DONNELLY. You spoke of the Patterson field and a slab of some 20 inches.

Mr. ROWE. Twenty-one inches; but in the same neighborhood we are now building for heavier aircraft 12 inches of concrete.

Mr. DONNELLY. In your experience in constructing airfields have you constructed a slab 4 to 6 inches?

Mr. ROWE. No.

Mr. DONNELLY. Have the slabs that you have laid exceeded 6 inches?

Mr. ROWE. Yes.

Mr. DONNELLY. I do not want to develop that further at this time, but I want to bring out the fact the work done there in Morocco under the specifications was that thickness.

General NOLD. Mr. Rowe was talking about concrete versus flexible pavement.

Mr. ROWE. I beg the gentleman's pardon, but I do not believe that is what they say there.

Mr. RILEY. You were speaking of a concrete slab; is that right?

Mr. ROWE. Yes, but what Mr. Donnelly just read was that that would be the top surface, which is the same as resurfacing a street. They just put the black top down on top of the brick or the concrete, or the old macadam, or something like that. What he is talking about, I believe, is putting some additional asphalt on the asphalt that already exists, and as I understand it, without having gone into it, there are at least 12 inches of other material already under the

black top that is now in place, so what you would finally have there is 12 inches plus 6 inches, which is 18 inches, and if you are going to put 2 inches more on that you would have 20 inches.

Mr. DONNELLY. I do not think that I misinterpreted this. Let me read the full paragraph, so that it will be in proper perspective:

> The proposed surfacing will, with the existing asphaltic binder and surface courses, provide 4 to 6 inches of bituminous base and pavement on the various aircraft areas at Nouasseur and approximately 6½ inches of bituminous pavement at Sidi Slimane. Even if it becomes necessary at some future date to add 1 or 2 inches of additional bituminous surface course to strengthen and level up the pavement, the over-all total thickness would still be appreciably less than that used on many airfields and roads in this country. As examples, the bituminous base course and pavement on the Newark runway now being constructed is 8½ inches in thickness. The asphaltic base and surface on the new Friendship International Airport in Baltimore is 10 inches in thickness. The asphaltic pavement on the New Jersey turnpike, which was designed for low maintenance with 35 years' life, is 12 inches. The concrete pavement on the runways at the Idlewild International Airport is 12 inches in thickness.

I interpreted that to mean with this additional course the total will be still no more than 4 to 6 inches.

Mr. ROWE. That is not correct. That is just the total of the asphalt surface, Mr. Donnelly.

Mr. RILEY. Would you give us the construction, beginning with the compacted soil, and then come on up?

Mr. ROWE. I can only tell you what I saw being built over there currently, Mr. Riley. How much detail do you want on that, sir?

Mr. RILEY. Start with the compacted soil leveled up.

Mr. ROWE. It is almost necessary, I believe, for an understanding of it to have a little picture. We will say that [indicating] represents what we call a strip line; in other words, this fluffy soil will carry nothing. What they ordinarily do is to go in and take that unsuitable material out and then backfill that with a suitable excavated material. It might come from a borrow pit, or it might be adjacent to the runway, and they bring that up to a certain level. In other words, the profile on this excavated area for a runway might look like this [indicating] because the unsuitable material does not always lay uniform. So what they were doing over there when we were there, they were taking this unsuitable material out and then they backfilled that with a special borrow material so that the top surface of it was 16 inches below the finished top of the pavement—the finished black top. In other words, what they did was, after they put this special borrow in down here [indicating] and compacted it, they put in a 6-inch course of stone which they processed, and then they put another 6 inches on top of that, making a total of 12 inches, and then they put what they called a 2½-inch binder course of asphalt on top of that—which is about the same procedure that is used around here on the streets and the highways—and then an inch and a half of finished top on that, and that comes up to the 16 inches of processed material which provides the bearing for the planes that will be used on these facilities. Not only the runways, but the taxiways and the aprons were being built in that manner. I understand that the previous work was done in the same way.

Mr. DONNELLY. I think that that coincided with the statement here. It says 4 to 6 inches of bituminous base and pavement. This statement does not refer to the rock or gravel base course that under-

lies the surfacing. As you presented it to us on your sketch, as I remember, it added up to about 5½ inches—the asphalt.

Mr. ROWE. It adds up to 4; 2½ and 1½ adds up to 4 inches.

Mr. DONNELLY. How does that compare with other airfield paving construction?

Mr. ROWE. That is the conventional practice, the conventional design, I might say.

Mr. DONNELLY. When Mr. Porter makes reference to the bituminous base course and pavement at Newark runway now being constructed as 8½ inches in thickness, does that indicate something in excess of the conventional design?

Mr. ROWE. No; it would not.

PROPRIETY OF CONTRACTUAL RELATIONSHIP BETWEEN MORRISON-KNUDSEN SUBSIDIARY AND ATLAS CONTRACTORS FOR OFF-BASE UTILITIES

Mr. DONNELLY. Passing on to another phase of the Maxon report, pages 7 and 8, there are two important questions raised. I will read for the record the pertinent paragraph.

> The functioning of the French commission was explained to the survey group with special reference to the fact that it has the right to construct all off-base utilities; that is, power lines, railroads, public highways, water lines, and POL systems which are required to be relocated or to be constructed as new facilities to service the bases. In effect the money for such construction is turned over to the French commission which then takes lump-sum bids. These bids are subject to the approval of the Corps of Engineers. General Walsh stated that the bids received to date have been quite satisfactory. The POL system was designed by Fay, Spofford & Thorndyke, under a subcontract with Porter, Urquhart, Skidmore, Owings, Merrill, project architect-engineers responsible to the Corps of Engineers for engineering studies, design and inspection, hereinafter referred to as PUSOM.
>
> The contractors on the POL system include Battingnolles, Morrison-Knudsen, General Walsh advised approval was obtained from the Chief of Engineers, Corps of Engineers, to have Morrison-Knudsen as a part of the French Moroccan contractors syndicate. Battingnolles, Morrison-Knudsen provides the experience desired. Atlas Constructors have no responsibility for this contract.
>
> General Walsh then stated he had recommended that the building construction program be placed on a lump-sum basis using local contracting firms. Lump-sum subcontractors are now working at Nouasseur base. It is planned to receive bids on the additional building construction and if bids are satisfactory, to make contract awards. Atlas Constructors is responsible for the performance of the contract but the awards are made subject to approval by the Corps of Engineers. The conference adjourned and we proceeded to the Nouasseur administrative headquarters with General Walsh.

This actually raised two separate questions: One is the status of this Morrison-Knudsen subsidiary as a contractor on the POL system. My understanding from a discussion with the various people who have worked on this is this: that this French subsidiary of Morrison-Knudsen has no contractual relationship whatever, or privity, with Atlas Constructors; that it is a completely separate organization and it is contracting directly with the French agency. Is that a correct understanding, Mr. Bonny?

Mr. BONNY. That is correct.

Mr. DONNELLY. And as far as the Government is concerned, I might ask the Chief of Engineers if this type of contractual relationship between this Morrison-Knudsen subsidiary and the French organization is a proper one?

General NOLD. That was gone into very thoroughly, Mr. Chairman. It was the subject of correspondence between the field and the Chief of Engineers. The Chief of Engineers had his senior legal counsel look into the matter. Inquiry was made and a determination was made that under the circumstances it was completely proper.

Mr. DONNELLY. I have heard criticism raised in some sources with respect to this particular contractual relationship. I do not think the facts as stated here and as indicated in the testimony, have come to the knowledge of those who have critized this relationship. As far as this record is concerned, my understanding is that Atlas, the joint venture of five contractors, has nothing to do with the Morrison-Knudsen subsidiary doing this POL work.

Then we get into this other phase, which is the lump-sum subcontracts in which Atlas is the prime contractor and the local French are the local subcontractors, and I understand, subject to correction here, that the amount of work contemplated under such subcontract is $48,000,000 and that the proposed subcontracts have raised at least three serious questions of policy which have given considerable concern to the Corps of Engineers, to Atlas and others involved. I understand that this type of subcontract is unique; different from the standard American form of contract, or subcontract, and the three questions are these:

First, the insertion of an escalator clause wherein the French subcontractor is entitled to more than the lump sum stated in the contract depending upon a rise in prices, or a rise in labor costs, or a rise in local material, so that he really does not have a lump-sum contract, he has in effect a contract with an escalator clause.

In this country such a contract would be subject to renegotiation. There is an application made to the War Price Adjustment Board—I think that is the correct name for the renegotiation board—to waive the renegotiation provision with respect to these subcontracts in Morocco. So my first question concerns the escalator clause and the second question involves the waiver of renegotiation. There is further a third point. Subject to correction, I understand that some agency of the Government has sought to waive the right of the American prime contractor, Atlas Constructors, in this instance, to have recourse or be sued in the American consular court in any litigation arising out of these subcontracts, and would instead require such litigation to be brought in the French courts.

Now, how shall we take these up? Does the corps want to discuss these points?

General PICK. I will ask General Hardin to answer that question.

General HARDIN. Mr. Chairman, the subcontract procedure which is proposed for this project is unique in that we are attempting to perform a subcontracting operation which we think in general is advantageous to the Government but at the same time we have to conform to the terms of the agreements which were incorporated in the basic authority to go into Morocco and do work. It is well known that in France and in French dependencies the method of contracting is different from that which is employed in the United States so far as the terms of the contract are concerned.

The French Government exercises a considerably broader field of surveillance of contracting operations, I think it can be properly said, than we experience in this country, particularly with respect to the

control of prices of materials and labor rates. They are not permitted, as I understand it, to charge any labor rates, or to sell materials at other than the rate the French Government sets on these tems. Therefore, the incorporation of the escalator clause in a subcontract is only in keeping with the contracting procedures which are inherent in the French system.

We had to take the matter under advisement because it was so different from our normal procedures in this country. We weighed the risks and the benefits involved and we came to the conclusion and so recommended to the agency that handles these matters that while it was somewhat irregular from our standpoint we thought that it would have to be incorporated in the subcontract provisions if we were going to subcontract the work with foreign nationals.

The same general reasoning applies to the item of renegotiation. We are, as you well know, required to incorporate provisions for renegotiation in our construction contracts. However, in endeavoring to use the French organizations abroad, they are unwilling to have any provision in the contract for renegotiation and, from a practical standpoint, if we wanted to use these foreign contracting organizations we deemed it necessary to waive that provision which is inherent in our systems in the United States.

We so recommended in that connection in the submissior of this subcontract to the Department of the Army, for approval. I believe that covers two of the items. I have for the moment forgotten what the third one is.

General Pick reminds me that from the standpoint of historical background we embarked on some of this operation in the past without these provisions, without the provisions of normal American contracting. We have omitted these provisions for escalation and renegotiation because it was the only way that we could get the work placed under contract—that portion which was off base and which, under the French agreement, was reserved by the French for themselves to do.

The third point, about subjecting the Federal Government to the jurisdiction of the French courts, is a problem, insofar as any effort that we would make to contract with the French directly—that is to say, for the district engineer to contract with the French contractor to do certain work—that would open up the United States Government, because the district engineer is an agent of the United States, to being sued in a foreign court in any matters that became matters of dispute between the contractor and the contracting officer.

As a matter of broad policy we endeavored to avoid that complication and we do not make contracts directly with foreign contracting firms unless there is some reservation in the contract which would protect the Federal Government from having to defend itself against suit in a foreign court.

Mr. Seltzer, who is our chief legal officer, I think might throw a little more light on that. I know he has made some investigation along that line recently and I would ask him to elaborate in any way he can on that.

Mr. DONNELLY. Have you any observation to make, Mr. Seltzer?

Mr. SELTZER. I just want to make this observation with respect to the jurisdiction of disputes in litigation. We must bear in mind that we are speaking of a subcontractor relationship and Atlas, as such,

must be recognized as a private citizen as distinguished from a public citizen. While it is true that the basic agreements between the respective countries involved call for the Moroccan or French courts to take jurisdiction in litigation or disputes, the subcontract in question provides for the subjection of the parties to that jurisdiction and permits intervention by the French mission, for example, but restrains the United States, which is the real party in interest, from any participation whatsoever.

So that if there is any inequity in the situation, it arises because one contracting party may bring his Government representative into the picture whereas the other may not.

In the case of any program of prime contracting in which the United States would be a contracting party, you have a different situation. There, if the United States is a contracting party along with a French or Moroccan contractor, and the French or Moroccan contractor would institute a suit as a claimant or otherwise, you then become involved in a question as to what is the status of the United States. Does it carry its sovereignty into the French courts or is it in the capacity of a private entity? That question has not been resolved. There is one school of thought that believes that because we are engaged in a mutual defense activity, the sovereignty of the United States would be preserved. On the other hand, another school believes that question really has not been resolved to anyone's satisfaction and is now the subject of discussion and undoubtedly may have a material bearing on how far the United States can go as a prime contractor in foreign countries.

I think the situation is not isolated or restricted solely to Morocco.

With respect to renegotiation I have this comment to make. There is a petition pending before the Renegotiation Board, which is an independent agency, to exempt these jobs, subcontracts, from statutory renegotiation. I might say there that the subcontracts that were developed were the best that could be developed with the French mission which had the responsibility as the other side to agreeing with the district engineer to a form of subcontract. It was the best that could be obtained. It is not necessarily the most acceptable or desirable.

I think the record should also indicate that our views on that subject have been made known to the Secretary of the Army and it has been pointed out that the orderly and economical progress of the construction program must go forward, although we are cognizant of the apparent deficiencies of this subcontract under which we are operating.

Of course, the Atlas Constructors would go into French courts as an agent of the United States, but there would be no participation by the district engineer as a contracting officer under this form of subcontract. So that if, for example, the contracting officer had made some decision in connection with a change in the scope of the work, or something like that, his action in that connection would have no status in the French court. But if the French mission representative, the chief of that mission, had made a decision in connection with that, and the contract so provides, his opinion would be entitled to recognition.

Mr. Davis. Would not an adverse decision by a French court against the prime contractor, the Atlas Constructors, obligate the

United States to pay, with the effect that Uncle Sam would be stuck with the works?

Mr. SELTZER. There is no question but that Uncle Sam is the real party in interest and ultimately is going to bear all the costs of any litigation.

Mr. DONNELLY. With respect to the courts, has the question come to the point yet where the United States through the district engineer has contracted with the French, or with any French subcontractor?

Mr. SELTZER. I would like to refer the answer to that question to General Walsh.

General WALSH. Yes; Atlas has made several subcontracts with French firms for work to be done.

Mr. DONNELLY. The first question was, Has the United States through the district engineer made a contract with a French subcontractor?

General WALSH. No.

Mr. DONNELLY. And the next question is, Has Atlas, as the prime contractor and agent of the United States, made any such contract with the French or a French subcontractor?

General WALSH. Atlas has made subcontracts of main contracts with French contractors.

Mr. DONNELLY. In round figures, do you know the amount of money involved? Does it run into the millions yet?

General WALSH. I would say the total of those subcontracts would exceed a million dollars, but no individual one which has been entered into so far would approach that amount.

Mr. DONNELLY. Is my understanding correct, which I got through the conference that we had—not with you, General—that it is contemplated that there will be subcontracts totaling $48 million to French subcontractors?

General WALSH. How much?

Mr. DONNELLY. $48 million.

General WALSH. It might run to that sum if we got good bids on all of the buildings that have not yet been started. We have actually received bids on three different groups of buildings. The total amount involved there is around $8 or $9 million, but final signature has not been given to those contracts pending the decision on the renegotiation question.

Mr. DONNELLY. There is an established body of law in the Federal judiciary in this country having to do with construction litigation under Government construction contracts. With reference to subcontracts let or to be let, is the United States in the position of subsubmitting itself to the French theory of the law on construction contracting?

Mr. SELTZER. No, sir. Atlas is the nominal party in interest and the subcontracts, as I recall, expressly provide that in the event of such litigation the United States—the contracting officer of the United States, as I recall it, is not mentioned as such, but the contracting officer has no status and it is expressly agreed that he shall have no status.

Mr. DONNELLY. That brings us to Atlas. What is the position of Atlas? Is Atlas willing to enter into these subcontracts under these conditions?

Mr. BONNY. The position of Atlas is simply this, that Atlas agreed at the time it assumed its contractual obligations to subcontract wherever possible. Atlas, on the advice of its attorneys, has called the attention of the district engineer to the inequities in these proposed subcontracts and has requested that the subcontracts if possible be so revised that those inequities are eliminated.

I believe Mr. Seltzer's statement is much more accurate and complete than I can make. Mr. Dudley is here and can clarify the matter, but our position is that we have to do what we are ordered to do.

Mr. MCNUTT. May I also invite the attention of the committee to a decision of the Court of International Justice, the latter part of last month, having to do with the rights of citizens or proteges of the United States in Morocco and dealing especially with the jurisdiction of the consular courts. Those decisions were not available here until Monday of this week. I spent most of yesterday reading this some 80-page decision and I frankly confess that I am not yet ready to give my own opinion, in a case of the jurisdiction of the consular court where the defendant and the defendant only is a citizen or protege of the United States.

I know that the decision has given some concern, a great deal of concern, to our own State Department and our Department has not yet reached a decision as to policy and has not yet issued instructions to the consuls in Morocco.

However, it is wise to bear in mind that there is such a decision and that it may have some bearing on that particular question.

Mr. SELTZER. Mr. Chairman, may I make this suggestion, that possibly because of the conditions that exist in the international agreement under which we were permitted to enter into Morocco, it was provided that the jurisdiction of the French and Moroccan courts would be exclusive and prevail. So that, as Governor McNutt has indicated, once you digest the decision he referred to you still have to consider whether the existence of this international agreement, peculiar to this operation, does not take this job out of the benefits of that decision to the extent that there may be some benefits inuring to the United States.

Mr. MCNUTT. I am not too sure that there are any benefits in the decision.

Mr. DAVIS. This appears to put our Government in the position comparable to that of an insurer or guarantor who specifically bars himself from being a party in case of litigation.

Mr. SELTZER. That is right. I might say also that the Corps of Engineers strongly recommended to the Secretary of the Army that we find some ways and means to reopen negotiations with a view to obtaining an agreement which would be much more satisfactory from our point of view.

Mr. DAVIS. We have lost our bargaining power on that, have we not?

Mr. SELTZER. I do not know. I do not feel qualified to answer that.

Mr. DONNELLY. If we look at it from the standpoint of Atlas as the plaintiff, in the case of a default or defective performance of a French subcontractor, is the United States in a position to force Atlas to go into the French courts as a plaintiff and sue the French subcontractor?

Mr. SELTZER. I think that is a relationship between the United States and Atlas. I believe that it would be in order and consistent with the terms of our relationship to direct Atlas to initiate litigation. But I think we would have to stop there, because at that point Atlas must be on its own and whatever action it takes in connection with the litigation that is in court must be its own and not that of someone else, such as the contracting officer.

Mr. DONNELLY. And would it be counsel for Atlas trying to recover moneys of the United States—Governor McNutt or other Atlas counsel—or would it be some counsel of the United States?

Mr. SELTZER. That is right; private counsel. That would generally be the answer.

Mr. DONNELLY. So, in effect, the United States as a plaintiff loses almost complete control over the expenditure of its money in these French subcontracts and from the standpoint of being a defendant, the United States is effectively precluded or barred from participating in litigation which Atlas must defend, whether the litigation takes 1 year or 10 years?

Mr. SELTZER. As an attorney that is certainly my opinion in this particular case to which I have referred.

Mr. DONNELLY. Is there any alternative to this impasse? Is there any way to do this $48 million worth of work, for example, as a prime contractor and get away from this situation?

General WALSH. That is the alternative; that is part of the work for which we now have a contract with Atlas. The attempt to have it done by subcontract was twofold; one, to comply with the general terms of our agreement to have as much of the work done by the French as possible, and secondly, to insure that we got the job done in the most economical way possible.

In determining whether the work should be done by subcontract, we asked Atlas to prepare an estimate of the cost of doing the work with their own employees and with the plant that they have and the materials that they have on hand and to compore that estimate with the bids that we secure for the execution of the work. Atlas' estimate of cost was carefully reviewed by the district engineer and agreed to as being a fair cost estimate for Atlas to do the work. We only undertake the work by subcontract if the bid price is less than Atlas can do it for with their own forces.

Mr. DAVIS. General, are you obligated to accept the lesser price by the subcontractor rather than to award it to the prime contractor?

General WALSH. No, sir. That is a decision that the contracting officer, the district engineer, can make.

Mr. DAVIS. There is still some leverage that perhaps could be used to get a better agreement with respect to subcontracts?

Mr. SELTZER. Possibly. We are making the effort, anyway. We have been very diligent about it.

Mr. DONNELLY. Is it true that these subcontracts for work that is necessary and vital for the construction of these bases have been delayed a period of months in the negotiations attendant upon trying to work out this problem? Has work been held up for months?

General WALSH. The bids on the first part of the work proposed to be subcontracted were taken in July, I believe on the 9th of July and we have not consummated those contracts as of this date because primarily of the question of renegotiation.

Mr. DONNELLY. Is the work covered by those bid documents necessary work, work that should be constructed expeditiously?

General WALSH. Yes. It involves a large part of the buildings at Ben Guerir, such as mess halls, latrines, and day rooms; some of the maintenance buildings; items such as the operations building and control tower at Nouasseur and several small buildings at Sidi Slimane. We have an additional series of buildings on which bids are to be opened this month.

Mr. DONNELLY. We have covered the question of the United States with the French, and Atlas with the French. How about the United States money which is being obligated by the French agency, Travaux Publique, with French subcontractors?

General WALSH. I believe it would be desirable to give you a little more detail on that subject. As a part of the terms of our agreement with the French, it states that work off bases ordinarily done by French public utilities agencies will be done by that agency of the French. In addition, it adds the off-base POL system.

The procedure of getting that done is to work up the details of the job desired and we submit what we call Form 101 to the French liaison mission, stating what we want done.

They then proceed to advertise the work by asking the public works division of the French Moroccan Government, or the French controlled railroad, or the Government Post & Telegraph Co., to take bids on the work and then finally to negotiate with the bidder that they feel is the most desirable one from the French point of view and submit prices to the district engineer. He can either accept that or say that he disagrees with the price quoted, for any reason whatsoever. If he disagrees, then the French liaison mission goes back to the agency involved and tries to get a more reasonable price. That has occurred several times.

When the price is acceptable to the district engineer, he then tells the French liaison mission to proceed and that permits the United States to pay to the French liaison mission the necessary funds to cover the work that was described in Form 101.

General PICK. Mr. Chairman, that system is the system which is being employed by the Army in France now for military construction.

Mr. DONNELLY. Suppose there is a default or defective performance of that construction work, what recourse does the United States have? Where do we sue?

General WALSH. That, I believe, is a moot question. That has not occurred so far. But our only recourse would be to demand of the French liaison mission that they procure complete performance in accordance with Form 101 that we gave to them.

Colonel DERBY. We do not pay in advance, either. If we get a default we do not pay for it.

Mr. DONNELLY. And if you do not pay, I take it that we will be sued for the money.

Colonel DERBY. They would have to sue the United States direct on that and there is not any provision for their doing that.

Mr. DONNELLY. Is this French construction agency that you speak of—I believe the title is Travavy Publique, is that right?

Colonel DERBY. Yes.

Mr. DONNELLY. Is that an agency of the French Government or any political subdivision of the French Government?

General WALSH. Yes, sir. There are other agencies besides Travaux Publique.

General PICK. There is the agency for roads and bridges.

General WALSH. There is also the French-Moroccan railroad company that does the off-base railroad work and the P. T. & T.—that is, Post Telephone & Telegraph Co., that takes care of the matter of telephone lines.

Mr. DONNELLY. When the French public works agency does this work, does it in turn contract with French contractors?

General WALSH. Yes. It can do it in two ways. It can do it itself with its own forces, if they are adequate to do it, or it can enter into a contract with French or Moroccan contracting firms to do the work.

Mr. DONNELLY. How much money, in round figures, is involved in this work to be done by the French agencies?

General WALSH. As of the 31st of August, it amounted to about $3,300,000. But there are several considerably larger jobs that are in the mill at this time that have not been finally consummated.

Mr. DONNELLY. Can you give us an approximate cost of the off-base POL system in the aggregate?

General WALSH. The latest estimate that I have seen, which is based on criteria which are now out of date, is about $33 million, and there has just been a conference here in Washington, on the 2d of September, which changed the criteria, which will probably result in a reduction of the cost.

General HARDIN. The latest authorization of cost on that is $39,500,000, of which $35,196,000 has been programed.

Mr. RILEY. How much has been appropriated?

General HARDIN. That means the same as appropriated for—$35,196,000.

General PICK. Mr. Chairman, there is one question of Mr. Donnelly's that I believe has not been answered definitely and that is: What happens when the work is constructed and the contracting officer decides that it is not satisfactory and does not come up to the standard?

Mr. RILEY. We will be glad to have that cleared up.

General PICK. In France, the Army is working under the agreements over there now that the contracting officer may reject, and I know of instances where certain work has been rejected and has had to be done over.

General WALSH. May I add something to that?

Mr. RILEY. Does the same practice hold true in Morocco?

General WALSH. That is what I wanted to add a further comment on. The French contractor with the Travaux Publique objected to the contracting officer's inspection of work on a gasoline storage tank and said that it was none of the district engineer's business. We claimed that the work was being done for us and very definitely it was our business to see that we got what we paid for. The French liaison mission upheld that stand very vigorously and we have had no further trouble from that source.

COST OF POL SYSTEM

Mr. RILEY. While we are discussing the POL system, is it true or not that it is more extensive at the present than was at first contemplated?

General WALSH. No; I do not believe that it is more extensive. The very recent conference that was held here early this month reduced the criteria very considerably from that which was given to us at first.

Mr. RILEY. I was under the impression that the initial program called for something over $21 million and now it is $39,500,000.

General WALSH. My recollection of the figures is that the first-line-item amount was $27 million plus; that in the reprograming based on estimates that were made in April of this year the work was set up at $39,500,000 and more detailed estimates since then have reduced that to about $33 or $34 million.

General HARDIN. I think Colonel Derby can throw some light on the original concept.

Colonel DERBY. There has been very little change in it since the program actually firmed up. There has been all sorts of talk about that POL system, but there has been no actual change in it. There has been talk of doing part of it and deferring other parts, but the total ultimate plan of the POL project has remained substantially the same ever since the beginning of 1951.

OVER-ALL COST OF MOROCCAN BASES

Mr. DONNELLY. There has been much confusion about the over-all cost of this job. Some reports and indications have been that the job is costing $420 million for two bases whereas the original program was $300 million for five bases. And this is an integral part of it. The original authorized cost was $300,575,000 for the over-all project, including the five bases and the POL system. In April of 1952 that total figure of $300,575,000 was reprogramed—that is the Air Force term for changing things around—so that the total figure remained $300,575,000, but the various components of the entire over-all Moroccan construction were changed in price. In the POL system there was an increase in actual dollars of $16 million. There was an increase from $21,283,000 to $39,500,000. But that was done by adjusting the cost of some other bases. So that as of April 7, 1952, the cost of the Moroccan construction as the Corps of Engineers and Atlas undertook it remained at $300,575,000. (See table on pp. 528–529 of these hearings.)

I understand further that the Air Force has programed additional increments on the facilities which account for any money in excess of $300 million. So that any difference between $300 and $420 million is not for the original work, but it is for additional work. Am I right about that, General Pick, or General Hardin?

General PICK. That is my concept of it. General Hardin, is that your concept of it?

General HARDIN. Yes, sir; that is the situation.

Mr. RILEY. General, while we are on that, is it not true that in this reprograming, they cut out certain facilities on these bases in order to build necessary facilities for initial use, such as the POL system? They left off certain things on the bases and allocated that

money to more vital projects. Now the increase comes about by wanting to put facilities on the bases that they had cut out in the reprograming in order to make the air bases usable as early as possible and the POL system was one of those things that you had to have right away; is not that right?

General HARDIN. That is right.

General PICK. General Walsh has a statement he would like to make in connection with that.

General WALSH. If I may, Mr. Chairman.

Mr. RILEY. Yes, sir, General Walsh.

General WALSH. There is more to it than just simply cutting out some items in order to take care of increased costs. The scope of the project that was to be built in 1951 was considerably greater than the scope that was originally contemplated.

As I brought out earlier, we had authorized 200 by 9,000 feet runways and we actually had to build 200 by 11,000 feet at two bases, and 200 by 14,000 feet at Benguérir.

There were other items of the same character which were considerably increased in scope. By that change of scope you increased the cost of those particular line items very, very considerably.

Also, in the reprograming there were certain items which, after full consideration of the use to be made of those bases, the Air Force decided to leave out, and there were certain other items which had not been originally included which they now feel are necessary, which were added.

Colonel DERBY. If I may add something on the question of the increased cost of POL, a good part of that has come about in the changing of the location of the bases. It was not originally contemplated that this base down at El Djema Sahim was involved, which would have resulted in a different number of miles of pipeline, although the principle of going to all bases was the same. So the actual number of miles of pipe has been increased by shifting around, so that you have that link across from Ben Guerir to the port of Safi. It has a further advantage of giving an additional outlet to the sea. But I think that link across the bottom that you see on the map there was not on the very early plans, although it got in at quite an early date. I think that is part of the cost. My first statement on that was not completely correct.

Mr. DAVIS. So far as you know, is this still a $300 million project, or what is the validity of this $420 million?

General HARDIN. Mr. Chairman, for your convenient reference may I show you a tabulation which I believe will help to clarify this matter of the scope of the program and the present status as of September 17.

You will notice the program is in two major parts. One of them is called the program exclusive of the special items. The special items are at the bottom and include such things as aircraft warning and navigation aids and so forth. The prime program, so-called, is indicated in the upper portion of that tabulation and is split in accordance with the year of the appropriation of the funds.

You will notice the bracketing on the side indicating the $300 million program extends through fiscal years 1951 and 1952, and an item of 1952 which is called the carry-over, which had to be appropriated for actually out of the 1953 appropriation act. But the $300 million program was the program that existed up through the fiscal year 1952.

The addition to the $300 million program is indicated by that bracketing showing $421 million. It comes out of the two items: fiscal year 1953 appropriation and authorization, and a contemplated 1953 supplemental.

You will notice the authorization the Congress has given for this project exclusive of the special features totals $398,990,000, of which only $300 million is properly the original program. Of course, as you know, the original program was adjusted to stay within the $300 million figure.

Now, compared with the authorization, Congress has appropriated funds up to the present time of $333,667,000. Of that amount there has been provided to the Corps of Engineers, $288,280,000. There is pending at the present time those funds which are indicated in the last column, $45,387,000. That sum, which is for the 1953 program properly, has to pass through several levels of clearance; of the Office, Secretary of Defense; the Bureau of the Budget; and I understand several committees of the Congress; before it can be released to us and put to work.

So the program as authorized by Congress is truly only $398 million, rather than the $421 million. The $421 million, you will notice by the note, would have to come from a supplemental appropriation. I think it would also include an additional authorization, as we understand it.

Mr. DAVIS. Well, is this arbitrary factor of point 7 and point 8 which is referred to on this sheet you handed us at all realistic?

General HARDIN. I understand that has no reference to the anticipated cost. It was merely a means of allowing the program to proceed with the moneys which Congress has appropriated and which have been authorized.

Mr. DAVIS. But it hardly could be considered a complete project without that additional $22½ million, could it?

General HARDIN. Unless the costs are materially different. I understand that there was the thought that with better operations, more subcontracting, and improvement all around, that experience would possibly provide, you might be able to build this facility for the $398 million rather than the $421 million.

Mr. DONNELLY. May this tabulation be inserted in the record at this point?

Mr. RILEY. Without objection, it will be inserted in the record.

(The information is as follows:)

Program analysis, French Morocco, excludes special programs (Globecom, A. C. & W., etc.)

[In thousands of dollars]

	Authorization (1)	Programed (2)	Funded to Office, Chief of Engineers (3)	Pending	
				1 minus 2	2 minus 3
$300 million program:					
Fiscal year 1951	$79,599	$79,599	$79,599	0	0
Fiscal year 1952	178,375	178,375	178,375	0	0
Fiscal year 1952 carry-over	30,306	30,306	30,306	0	0
Fiscal year 1952 POL carry-over	12,000	7,696	0	4,304	7,696
$421 million program:					
Fiscal year 1953	67,095	37,691	0	29,404	37,691
Fiscal year 1953 first supplemental	31,615	0	0	31,615	0
Total	398,990	333,667	288,280	65,323	45,387
Ben Guerir	68,628	53,157	42,413	15,471	10,744
Nouasseur	130,442	112,703	105,737	17,739	5,966
Sidi Slimane	73,249	65,291	60,328	7,958	4,963
El Djema Sahim	49,214	37,016	27,400	12,198	9,616
Rabat	7,771	5,213	1,708	2,558	3,505
Boulhaut	30,086	25,091	22,194	4,995	2,897
POL	39,500	35,196	27,500	4,304	7,696
Safi	100	0	0	100	0
Total	398,990	333,667	288,280	65,323	45,387

The $300 million program consists of the fiscal year 1951, 1952, and 1952 carry-over programs.

The $421 million program consisting of the above programs plus the fiscal year 1953 and 1953 first supplemental, has been reduced to the present total of $398 million by the application by USAF of arbitrary factors of 0.7 and 0.8 to the various line items of the 1953 program.

The $2,890,000 recently received is included in above totals and covers warehousing and supply buildings at Nouasseur and Sidi Slimane.

Special programs

	Authorization (1)	Programed (2)	Funded to Office, Chief of Engineers (3)	Pending	
				1 minus 2	2 minus 3
A. C. & W.	$11,000	$4,700	$4,700	$6,300	0
Navaids	2,889	2,889	292	0	2,597
Classified storage	4,818	4,248	3,658	570	590
Globecom	3,499	3,384	2,499	115	885
Seaweed	480	480	480	0	0
Total	22,686	15,701	11,629	6,985	4,072

Mr. RILEY. It is too early yet, General Hardin, to know whether or not you can build the facilities for the $398 million?

General HARDIN. Yes, sir; I think it is too early.

Mr. RILEY. That is just a hopeful situation.

General HARDIN. As a matter of fact, Mr. Chairman, we will not know what we can do until we get these two new sites and have detailed plans prepared for them. If the two sites we are now contemplating building upon do not materialize and two other sites may be substituted for them, our figures necessarily will be greatly influenced by whatever we are required to do.

Mr. RILEY. Both of these new sites still are under negotiation?

General HARDIN. Well, they are not under negotiation so much as they are under the process of having a right of entry given to us to proceed with the work.

In one, at Boulhaut, the problem there is the part that the United States will do and the part which the French will do with regard to certain access roads and other matters, such as relocation of facilities, which was their responsibility. That matter has not yet been cleared up.

At the El Djema Sahim site there is the matter of a real estate problem, in which the original land which had been agreed upon under the negotiations, which were considered complete, is inadequate to provide the facility which is planned for that base. They have to seek more land. General Walsh, I believe, could bring us up to date on the exact status of that.

General WALSH. Your statement is essentially correct.

In February of this year we felt that we did have the Boulhaut site. In the conference with the French liaison mission which was held by General Old about a month ago, concerning primarily the relocation of an existing road, telegraph and power line on the site, the French liaison mission advised us that that site was not firm. So we are completely in the air at the present time as to whether or not we will build the facility at Boulhaut or will not. General Old has submitted the picture as he sees it to Headquarters, USAF in Europe, and the French liaison mission has submitted their side of the question to the minister.

At El Djema Sahim the French have agreed to give us, I believe, 4,500 acres, and the real estate desired by the Air Force to take care of all the facilities proposed for that base is about 7,500 acres. They now have submitted to the minister in France a recommendation that something like 6,900 acres be turned over to us, and we are revising the lay-out to see if it can fit in the 6,900 acres that the French propose to give. But that is still a completely unsettled question.

General PICK. Mr. Chairman, I would like to ask General Walsh to explain the agreement which the United States has with the French Government with respect to these bases, insofar as it applies to the furnishing of the necessary lands and doing such explorations as are required.

General WALSH. The terms of the agreement are that the French will furnish to the United States a suitable site on which the United States will construct the air bases. The determination of the location of that site is a joint one between the United States Air Force and the French Air Force from the operational point of view, and with the French liaison mission in respect to the acquisition of land. It has been our contention that a site which has a major highway going through it, with telephone lines and transmission lines, is not a suitable site unless those lines and highways are relocated prior to the time the United States goes into construction. At Boulhaut the estimated cost of relocating the highway is about $250,000. We feel that that is not a proper charge and was never contemplated as a charge that the United States should bear.

General PICK. That, Mr. Chairman, would establish a very important precedent in connection with the building of the NATO bases, if we agreed to go in there and do these relocations.

Mr. RILEY. I can very readily see that. Of course, the French stand in the end to gain considerably from this venture themselves.

I was wondering why it was necessary to get almost twice as much land at El Djema Sahim as was first contemplated.

General WALSH. Why is there the increased acreage?

Mr. RILEY. Yes. It is almost twice as much.

General WALSH. The principal reason was that the total length of the air strip there, as at all the other bases, was increased above what was originally contemplated due to two factors; elevation and temperature primarily, and the development of the new types of aircraft. The dispersal of the ammunition storage, petroleum, oil, and lubricants facilities which will be located on the base, as well as the camp areas, and the required distances between certain facilities for safety, has necessitated the increase in the size of the base.

Mr. RILEY. I see. Thank you.

EFFECT OF ESCALATION AND WAIVER OF RENEGOTIATION CLAUSES ON COST OF PROJECT

Mr. DONNELLY. I had one or two other questions on the costing; but, momentarily, let us take up the escalation clause.

Have we had enough experience with that escalation clause in subcontracts to know whether or not the lump-sum price or the fixed price contracts have been increased by virtue of escalation?

General WALSH. On the few small subcontracts that Atlas has used up to this time, primarily for the provision of facilities that they themselves will use during construction, to my knowledge that escalation clause has not been utilized by the subcontractors.

Mr. DONNELLY. Now, when you look at the two things separately—one, escalation; and, two, renegotiation—and treat them separately, the results may be different from combining the two. If there is the escalation clause and a waiver of renegotiation, whereby this Government precludes itself from recovering any excess profits, do you have any views as to whether the combination of those two factors will produce a result which will not be beneficial to this Government?

General WALSH. I do not believe that we will be able to subcontact in any substantial amounts with French subcontractors if we have a requirement for renegotiation. I do not believe they will accept a contract with that requirement written in. I feel confident that the French liaison mission would oppose it very vigorously.

Mr. DONNELLY. Is the United States likely to be in a position to lose if you have both the escalation clause and a waiver of renegotiation? If we give them both, so to speak, is the United States likely to lose?

General WALSH. I do not feel that we will; no.

Colonel DERBY. It might be well to add here, if I may interrupt, that the escalator only comes in when the minister directs that wages be boosted a certain amount. In other words, it is not the contractor himself who has the privilege of deciding that costs have gone up. There are official wage rates which are fixed by the Government. The escalation is determined by the French Government rather than

the contractor on that. To the extent that you feel you can rely on the local government, you are safe on that, rather than the factor of the company.

ULTIMATE COST OF MOROCCAN PROJECTS

Mr. DONNELLY. Going back to the costing, I understand that the $300 million figure for these five bases and for petroleum, oil, and lubricants was an estimate which was gotten up at the very beginning in January 1951; is that correct?

Colonel DERBY. No, sir. There was a $400 million estimate in January 1951. That never quite got to Congress. They did not quite have the courage to submit that, so they whittled it down to lower figures in the course of the process. The original program which was handed to me on the 10th of January ran to $400 million. I think various items were stricken out at different times, and they are now finding their way back into this $400 million of the project you have here.

Mr. DONNELLY. That may very well be. As I understand it, the prime contract with Atlas is in two phases which aggregate $300 million; is that correct?

Colonel DERBY. That is correct.

Mr. DONNELLY. That was entered into in January 1951?

Colonel DERBY. The price figure was not set on that until about May.

Mr. DONNELLY. Of 1951?

Colonel DERBY. 1951; that is correct.

Mr. DONNELLY. I think the date will be May 28, 1951.

Colonel DERBY. That is right.

Mr. DONNELLY. I think it was in April or May that General Pick testified before this subcommittee with respect to the proposed reprograming of Morocco. At that time as I recall it General Pick was asked whether the Corps of Engineers' cost estimate for the five bases and related facilities had not undershot the mark and whether the cost would not be substantially more. As I recall his testimony, General Pick stated he had originally estimated that this construction would cost $300 million, and that the corps was going to build the original facilities for that figure and stay within it.

General PICK. I do not remember the exact testimony, but that sounds exactly like the impression I had at that time, sir.

Mr. Chairman, not only do I recall saying that, but we are of the opinion now that we are going to build that $300 million worth of work that we were talking about for $300 million now.

Mr. MCGRATH. Has there been an increased cost since you gave us that original estimate, General?

Mr. DONNELLY. If I can help out on the increase in cost, we have a cost breakdown at pages 520–529 of these hearings. There were changes due to price increases. There was a plus change of $45 million and a minus change of $11 million, with a net cost increase of $33 million, which would have been a little better than 10 percent of the $300 million. That was adjusted by changing some of the features.

But the $300 million figure which was estimated in January and May of 1951 as of today, as we sit here, I understand to be a firm figure for the original work.

General HARDIN. The original work, though, has changed so much, Mr. Donnelly, that you cannot quite say that, as I see the situation. The same items to be built are not in that $300 million program as it stands now, as they were in it originally. There have been so many changes in the program that I think it would not be right to say that.

If I may try to clarify that statement just a little bit more, Mr. Chairman: the $300 million worth of work allied to particular items in the program now we believe we are going to build for $300 million, but they are not the same $300 million worth of items that were in the program originally.

Mr. RILEY. In other words, in my layman's language, if the master plan had remained the same as was originally contemplated you could have done the work for $300 million, but the increased length of runways and other facilities, and the relocation of bases, is largely responsible for this increased cost which we are now facing; is that correct?

General HARDIN. A broad statement of that character is pretty difficult to say "Yes" or "No" to, because some features of the original $300 million program were underestimated. I think that that was the reason why, in that statement which Mr. Donnelly is referring to, there were pluses and minuses.

Mr. RILEY. But that would be true of the over-all cost, or the lump-sum cost?

General HARDIN. We would have had a usable facility under this $300 million worth of work which is in the program now if we had finished that. It would not have been the same degree of facility which is in the program now for $421 million, or $398 million.

General PICK. What he is saying, Mr. Chairman, is this: That to the original program there have been additions and subtractions. The original program was estimated at $300 million initially. That same $300 million worth of work is in the program now, and we expect to do that for $300 million; but the additions and subtractions do not leave you with the same items of work you started out with.

Mr. DONNELLY. Well, in summing up, was the original estimate of the Corps of Engineers of $300 million a good estimate, or was it way short of the mark, and is this job going to cost, for the originally contemplated work, some $400 or $421 million?

Colonel DERBY. The original estimate was not the Corps' estimate. The Air Force gave that to us.

Mr. RILEY. As I understand it, it was a pretty good estimate, although some facilities might have cost more and some less.

Colonel DERBY. Yes, sir.

Mr. RILEY. Now we have increased facilities there which account for considerable of the cost. Then you have a change in location, which is bound to cost you something, plus any rise in the cost of materials which has taken place in the interim.

Is there anything else that could be added to that?

Off the record.

(Discussion off the record.)

Mr. DONNELLY. May I ask the Corps of Engineers this question: I understand that the prime contract with Atlas, covering both phases, is $300 million, and that that is the price tag for the project which everyone has come to associate with the project. Does that include

the fee for PUSOM, the architect-engineer; and does it include the Government cost of administering the contract?

General NOLD. I think we will have to look that up, Mr. Chairman.

Mr. RILEY. Somebody ought to know that.

Colonel DERBY. The $300 million is the face value of the Atlas contract alone and does not include the PUSOM fee or the Government administrative cost, nor does it include certain Government items of material that were furnished.

Mr. DONNELLY. Well, will the corps insert in the record at this point a breakdown of the additional cost above the $300 million, to clear up any possible misconception. That would be the fee for PUSOM, the architect-engineer; the Government cost of administering the contract; and the cost of Government material supplied.

(The information is printed in the appendix at p. 209.)

Mr. DONNELLY. Mr. Chairman, I have not sought to go into every page, paragraph or sentence of the Maxon report. The report in toto has been printed in this hearing. I have sought to cover only what struck me as the highlights, the areas in which it appeared desirable to ask for amplification for the Maxon group.

I wonder if the members of the committee desire to ask any questions with regard to this.

Mr. RILEY. I have no questions. Mr. McGrath?

REASONABLENESS OF COST OF MOROCCAN PROJECT

Mr. MCGRATH. Mr. Rowe, I would like to ask you one question, please.

Based upon your experience and your investigation in this matter, would you be in a position to give us your opinion as to whether or not the United States Government paid a fair and reasonable price for this work, or whether or not the United States Government paid an excessive amount?

Mr. ROWE. You mean for the entire lot of the work, sir?

Mr. MCGRATH. For the part you have seen during your survey.

Mr. ROWE. I think the Government has gotten value received for the money it has expended to date.

Mr. MCGRATH. When you say that, do you mean that they paid the fair and reasonable amount for the work that was done?

Mr. ROWE. Under the circumstances.

Mr. MCGRATH. Under all the circumstances?

Mr. ROWE. Under all the circumstances.

Mr. MCGRATH. That would be your best opinion, based upon your years of experience and your observation while over in Morocco; is that correct?

Mr. ROWE. Yes, sir.

Mr. MCGRATH. Now, could you give this committee any evidence of any overcharging or any inferior work or anything which might be of help to this committee in correcting a situation which, in your judgment, would be improper?

Mr. ROWE. Beyond the airfield facilities we found no evidence of inferior work of any kind.

Mr. MCGRATH. From your experience would you be in a position to tell us whether we have gotten a fair value for the United States Government contribution and payments here?

Mr. ROWE. I think the Government has gotten the fair value for the money expended.

Mr. MCGRATH. And that opinion of yours is predicated not only upon your observations there, but I understand that you have made some physical inspection and borings while your committee or group was over there; is that correct?

Mr. ROWE. We made one boring, sir.

Mr. MCGRATH. Yes, but other people made other inspections and borings, did they not?

Mr. ROWE. That is right. The other people were the agencies who are now in charge of those tests.

Mr. MCGRATH. Did you have access to their findings?

Mr. ROWE. We did.

Mr. MCGRATH. That is all, Mr. Chairman.

Mr. RILEY. Mr. Davis.

Mr. DAVIS. I have some loose ends here that I jotted down a few notes on as we went along, so this won't fit in any pattern.

CONSTRUCTION UNDER WAY DURING MAXON SURVEY AT NOUASSEUR

First of all, your on-the-spot visit to north Africa was made in the first 2 weeks of August of this year?

Mr. ROWE. First 2 weeks, yes.

Mr. DAVIS. What actually was being done at Nouasseur in the way of construction?

Mr. MAXON. I don't know that I could detail it at this moment. Could you answer that, Mr. Keenan?

Mr. DAVIS. Were they actually laying additional runways or aprons at Nouasseur?

Mr. KEENAN. Laying black-top.

Mr. MAXON. There was some building construction under way.

Mr. DAVIS. My primary interest is with respect to runways and aprons and parking space and things of that kind. Was there new construction going on, or were they repairing old construction, or both, or what were they doing, if you can recall that specifically?

Mr. KEENAN. There were new roads going in, new buildings, new black-top surfaces going in.

Mr. DAVIS. Did you notice any construction that appeared to be for drainage facilities? Was any indication made to you by those on the spot as to whether those were drainage facilities that were being built as a result of their experience in the runway failures that they had had there previously on the apron, or whatever it was that did fail?

Mr. KEENAN. I don't know.

Mr. ROWE. At the time we were at Nouasseur there was a new apron being built, and new buildings were being built, including hangars, warehouses, and so forth. Answering your question specifically, Mr. Davis, they were constructing substantially 100,000 square yards of apron which was entirely new construction which I understood had started this year, and that included the excavation, the special fill material, special bases, and black top.

Mr. DAVIS. Perhaps I should explain that the basis of this questioning is the fact that there is testimony in the record with respect to Nouasseur that part of the responsibility for failure there was the fact that proper land had not been obtained for the construction of drainage facilities. Had such facilities been constructed at the time you visited north Africa in August of this year?

Mr. MAXON. You mean drainage facilities, or the lack of drainage facilities?

Mr. DAVIS. The lack of drainage facilities that had caused the failure.

Mr. MAXON. If that refers to the things which affected the drainage during construction, I don't think I can answer it. No, I will change that. Let me give you the history of that as we learned it.

We were told that during the early construction there was insufficient land available to store and properly remove from the site certain top soil. That top soil therefore had to be stored in dikes and fills above the ground level and surrounding the area of this construction under question. When the rainfall came, those dikes formed a pool. Those dikes largely have been removed since that time and drainage provided for the general over-all purpose.

If your question applies to drainage under the pavement constructed, that I don't believe has been adequately taken care of. It was my understanding that is part of the problem they are now facing.

Mr. DAVIS. Is that going to be a permanent problem there, or would you say that the acquisition of additional land would make it possible to clear that up so that it would no longer be a problem there at Nouasseur?

Mr. MAXON. It is an engineering problem. I don't think the acquisition of land—wait a minute. We are talking about two things; first, the general drainage during the early days of the construction, which was restricted by the lack of sufficient land upon which to place the removed top soil far enought away from he project to provide proper drainage; and second, we are talking about drainage of the subsoil under the present construction. The first one was the problem of acquiring property. I believe that one has been solved.

Mr. DAVIS. Let's see if we can get that answered definitely. Has it been solved?

General HARDIN. Yes. There was the problem of a ditch that would lead water from the operational apron at the time the rains came last year. That was rectified soon thereafter, and the drainage ditches were completed to provide the capacity to carry the surface water off.

General PICK. Is that your version of it, General Walsh?

General WALSH. That is my version of it also.

Mr. DAVIS. Then as to the second part of it.

Mr. MAXON. That is, to drain the subsoil under the existing construction. That part of it I do not believe has been fully determined. It is an engineering problem that was awaiting determination of the question of how much remedial work was necessary on that apron. That is my understanding of it. There are people here better informed on that than we are.

Mr. DAVIS. Would you care to comment on that?

General HARDIN. The drainage of the subgrade under the operational apron does not require any additional real estate or drainage structures, except that we have determined that it would be advisable to supplement the drainage planned under the operational apron by installing a catch basin to eliminate the formation of what are commonly called bird baths, very shallow depressions of an inch or fraction of an inch of water. That is one of the corrective methods authorized in the study, and that minor catch basin facility is being installed now, General Walsh tells me.

As to the problem of eliminating mositure in the subgrade of the operational apron, the forces of nature are drying it out and we are preventing, by compaction, the reabsorption of excessive amounts of water; and also by completing the asphalt concrete pavement in that area.

EXCAVATION FOR DUCT LINES

Mr. DAVIS. Mr. Maxon, what were you referring to in your report when you referred to rough spots caused by excavation for duct lines?

Mr. MAXON. Certain duct lines were installed under the runways from one side to another, transversely, at intervals along the distance of the runway and where the fill had been remade over them, those duct lines, we were informed, were placed subsequent to the placing of the sub-base. When the heavy roller went over the top, there was an additional compaction of the sub-base, resulting in a dip.

Mr. DAVIS. Is that in connection with some of the corrective action taken there, General Hardin?

General HARDIN. Yes.

Mr. DAVIS. Those ducts were not planned at the time the runways were originally laid?

General HARDIN. Yes, I think those were always planned. That is to provide the necessary night-lighting installations, and it is the habitual procedure in flexible pavement construction to compact the base courses, and during that time you try to get your conductors in and avoid the situation which arose in this instance, where you had to cut a trench across completed work and put your conductors in, and then backfill the trench.

I am not informed as to how it occurred. I would rather ask the district engineer, who was there then, as to why the trenching had to be done across the runway.

Colonel DERBY. We were not able to get the material we needed. We had to build the taxiways without tile pipes and other things that had to go in there, and then cut it afterward. I think we got them all under the runway before we were finished, but not the taxiways.

Mr. MAXON. I think that is correct.

Colonel DERBY. We gave priority to the runway, and then we ran short, and we felt the taxiways could wait, because it didn't make too much difference if there was a rough spot there. Of course we would have liked to have done it the other way.

CONSTRUCTION IN PROGRESS DURING MAXON SURVEY AT SIDI SLIMANE

Mr. DAVIS. Continuing with my previous line of questioning, Mr. Maxon, and switching over to Sidi Slimane, do you recall what type of construction work was in progress there during the first 2 weeks in August?

Mr. MAXON. They were operating a gravel pit, and preparing the material for use at a future date; preparing it and storing it for future repair work.

There was, I believe, at that site, the construction of a cafe under way. There was a sewage disposal plant under way. There was some grading and general work going on. I believe they were rolling on the taxiways and runway.

Mr. DAVIS. Which appeared to be work of a corrective nature; is that correct?

Mr. MAXON. Both, work of a corrective nature and new work.

Mr. ROWE. There were small connecting taxiways under construction at the same time which were entirely new work and not corrective measures.

Tests were being conducted by the use of heavy rollers, but there was no corrective work under way on runways or taxiways while we were there at either of the bases.

Mr. MAXON. Except the rolling.

Mr. ROWE. Except the rolling.

Mr. DAVIS. Were you able to observe those rollers actually in action?

Mr. ROWE. We did at Nouasseur observe a 200-ton roller in operation on the taxiways where the depressions had occurred. Unfortunately, the 200-ton roller that was to be used at Sidi Slimane was being used at Ben Guerir, and the 100-ton roller that they were using at Sidi Slimane had broken down just about an hour before we got there. The 200-ton roller from Ben Guerir was subsequently moved over to Sidi Slimane, and shortly after it arrived there it blew a tire, so we didn't get to see the 200-ton roller working at Sidi Slimane.

CONSTRUCTION IN PROGRESS DURING MAXON SURVEY AT BEN GUERIR

Mr. DAVIS. At Ben Guerir what was the status of construction there?

Mr. ROWE. At Ben Guerir they had completed the base on the 14,000-foot runway, that is, the stone base, and had about two-thirds of the base courses of the asphalt in place. They were also working on the taxiway, and making preliminary plans for the erection of part of the housing facilities for the Air Corps. There was also under construction the POL system, which was substantially completed.

Mr. DAVIS. You actually saw them laying pavement at Ben Guerir, then?

Mr. ROWE. No, we did not. At the time we were there the operations were suspended in the field and we did not actually see any of the new work being constructed, although we saw what had been constructed, as far as runways were concerned.

Mr. DAVIS. What is the significance of this statement in the report, which appears on page 33:

> Although the surface of the leveling course had a rather smooth finish, it was observed that no failures had occurred on a test section of the runway including the binder course.

I imagine that has some significance to engineers. It doesn't to me.

Mr. ROWE. As has been pointed out here in numerous statements, the materials available for the construction of these bases had required very extensive field research by those set up to make the field investigation to determine what materials would be available, and the most suitable material obtainable in that area was a rather soft limestone, and in the processing of this limestone it would form a cake on the top of it.

Ordinarily it is desirable to have the rock base so that the asphalt will bind on it, so when we saw certain sections of the runway had this coating on it, we immediately raised the question as to whether or not it was desirable to have this coating on, as ordinarily in construction practice it is not permitted.

The area engineer then took us up to about the middle of the runway. This question had previously come up before the architect—engineers, and I presume the Corps of Engineers, and in order to prove or disprove the theory that I and some other people evidently had had that it was not necessary to have the ramp fully exposed, they had constructed a section of the runway on which they had already placed the asphalt surface, and over this area they had towed the 200-ton roller 200 passes, and they had had no slippage or any failure, and therefore we assumed that even though the appearance was contrary to construction practice, after the tests were made, it was an approved method, considering the type of materials available.

I am surprised you picked up this small item.

Mr. DAVIS. That is our job.

General WALSH. Because of the smooth surface we got because of the large amount of rolling, both rubber-tired and smooth-wheeled, we found it necessary to broom, with a heavy broom, that top surface before we put on the prime coat, and by that brooming removed a large amount of the slick-appearing surface and gave the base course the necessary roughness.

General PICK. Also, what they are talking about now, Mr. Chairman, is the surface between the black-top material and the base rock, not the wearing surface of the black-top runway.

Mr. DAVIS. Would you call this method of construction a peculiar adaptation to this particular place, or have you adopted that as somewhat of a standard method of construction now?

General WALSH. The formation of the more or less slick surface is a characteristic of the rock at this particular point.

Mr. DAVIS. As I gathered from your previous comments, from your on-the-spot inspection you were favorably impressed with the construction now in progress at Ben Guerir; is that correct?

Mr. MAXON. Yes, sir.

UTILIZATION OF MANPOWER

Mr. DAVIS. What comment would you make on the utilization of manpower as you observed the construction? You might want to compare it with your experience in the continental United States and also your experience in overseas construction.

Mr. MAXON. I would like Mr. Keenan to answer that.

Mr. KEENAN. From my observation, I saw no loafing, no racing of heavy equipment in and out of pits. I particularly noticed that, in

the gravel pit at Sidi Slimane, where it easily could have slipped over the bank, they were very carefully driving their equipment.

The maintenance of permanent equipment, such as we call plant, had been such that it appeared to me that it was all operating just as though it were new and could take on any additional amount of work; it was in good shape.

The asphalt plants looked like they were brand new. One had been moved from Sidi Slimane to Ben Guerir, and it looked like a new plant. It was just being set up and would be ready to operate, I think, within a few days.

No matter where we went, whether in the cookhouses or the warehouses, my observation was there were not too many men. I didn't go into the bookkeeping end of it, but there were not too many men, and everyone was working, and in the higher levels everyone was looking for more work to do.

Mr. DAVIS. Did you observe both American and native labor?

Mr. KEENAN. I observed all labor that I came in contact with. In the carpenter shops everyone was working; in the machine shops everyone was working. The native labor was there ready to take care of any emergency that might happen. The plant runs by itself, but when something unusual happened, they were there.

I was very much impressed with the whole operation.

Mr. DAVIS. About how many people did they have on the job at Ben Guerir?

Mr. KEENAN. Two thousand, I think, approximately.

STATUS OF COST ACCOUNTING RECORDS

Mr. DAVIS. Going back to the discussion we had just before the recess for lunch, Mr. Maxon, would you say that there was any too much detailed cost accounting being done at the present time, in your opinion?

Mr. MAXON. I would like Mr. Burke to answer that question. I might put in a general statement there, that I believe that due to the urgency of getting all past records up to date, there is a tremendous concentration of work on all types of records that will not follow through when they are up to date. On cost keeping, I would like Mr. Burke to answer that.

Mr. BURKE. Obviously, after their cost records are brought up to date they will not have too much cost keeping. In the cost engineering section, we thought they had too few people in that section.

Mr. DAVIS. My question was directed more to the details of their present system of cost accounting. Is it too cumbersome?

Mr. BURKE. No. I would say they are not keeping too much cost records.

Mr. DAVIS. Then what explanation did you get for the failure to keep cost accounting records in the past?

Mr. BURKE. Well, as somebody else has already stated, initially they got off on the wrong foot with the records. The machinery and materials arrived before the personnel, and the records never have been brought up since. Let me elaborate there.

On labor cost records they are doing exactly what I would do if I were over there on the job so as to determine cost. There is nothing

wrong with that. They are not doing any more nor less than I would do.

On their equipment, the same is true. There is nothing wrong with the way of determining the equipment cost.

The only thing that is behind is the cost of materials going into their facilities. That is the only deficiency I found in their cost keeping.

Mr. DAVIS. Let me ask you this, Colonel Derby: In the early stages of this operation, did you contemplate that some time or other you would get caught up with your cost accounting, or at last along the line did somebody tell you that you had to do more cost accounting than you had contemplated?

Colonel DERBY. No. We contemplated catching up. We were very slow in getting the right people for that particular type of work. In February of this year when Mr. Wilbur came he said he was the only man on the job who knew anything about cost accounting, and he didn't have time to do it. We had been after that cost keeping for some time. That was one deficiency they definitely had for a long time, and we saw very considerable improvement in it as soon as Mr. Wilbur got there. Even with the people that he had, he was able to coach them enough so that they were able to get out some very useful cost statements.

Mr. DAVIS. Then it stands on the record that it was well over a year after construction was started that a real effective system of cost accounting was put into effect; is that correct?

Colonel DERBY. No, sir. We didn't get started in construction until well in April, and they seemed to have a pretty good system started by March of this year. They put out that first statement I mentioned the 31st of March or the last of February, I forget which.

Mr. DAVIS. Do you agree substantially with that, Mr. Bonny?

Mr. BONNY. I agree substantially; yes.

DEPRESSIONS AS RESULT OF ROLLING AT NOUASSEUR

Mr. DAVIS. On page 36 of your report, Mr. Maxon, appears this statement:

> An inspection of the operational apron at the Nouasseur base, one-third of which had been rolled with the 200-ton roller, was conducted. Evidence of depressions were frequent.

As an experienced constructor, would you consider those evidences of depressions as indicating weaknesses in construction that will require substantial redoing?

Mr. MAXON. I believe the depressions would indicate a weakness underneath, or the weakness may be in the subbase, which can be corrected by additional rolling. Your question as to whether that is evidence of any particular amount of construction to be done as a remedial matter would depend entirely on further tests.

Mr. DAVIS. We will defer further questions on that until tomorrow, I guess.

Mr. MAXON. I might add that what we call depressions in this report are probably synonymous with what General Hardin called bird baths a while ago.

Mr. DAVIS. They may have been consciously created depressions, then?

Mr. MAXON. No, not consciously created, but created in a conscious process.

Mr. DAVIS. I understood General Hardin to say that some of these bird baths were made purposely.

Mr. MAXON. I think you misunderstood General Hardin.

General HARDIN. No, sir. The bird baths I had reference to came in the operational apron as a result of running the compaction roller over the area, particularly in the lower area of the operational apron. We feel that for a proper type of drainage for an apron of that nature, it should be improved to the degree of quick draining after a rain.

STATUS OF PROPERTY ACCOUNTING

Mr. DAVIS. Referring to your comment on page 48 on the property accounting, on which there has been some discussion here previously did you have an opportunity to consult with top management, as you have referred to it here, to form an opinion as to whether or not the constant attention of top management is directed to the problem of accomplishing results now?

Mr. MAXON. Yes, sir; we took that matter under advisement several times—myself, Mr. Rowe, and Mr. Burke, and Mr. Keenan at times. We discussed the problem with the cost accounting people, with management of Atlas Constructors, and I think that is about as far as we went with it, but there was plenty of opportunity taken to discuss that with them.

Mr. DAVIS. Are you now satisfied that tangible and effective steps are being taken to bring those records into proper shape?

Mr. MAXON. Absolutely.

Colonel DERBY. So far as my comment about Atlas' deficiency in cost keeping is concerned, they kept a lot of detailed records. What they were short of was the cost-keeping men who knew how to analyze the figures and put the figures together so that they would mean something to me.

EXCESSIVE HOUSING CAPACITY AT BEN GUERIR

Mr. DAVIS. You mentioned in your report, Mr. Maxon, that at Ben Guerir the operating capacity was double that required.

What explanation did you obtain with respect to that?

Mr. MAXON. Are you referring to the camps? Are you referring to the housing capacity of the camp?

Mr. DAVIS. Was it the housing capacity? I neglected to put down the page.

Mr. MAXON. Page 28, Mr. Burke says. That is the capacity of the construction camp, the camp for housing personnel and the recreational facilities and the commissary facilities for taking care of that personnel. Now, what was your question?

Mr. DAVIS. What explanation did you obtain from those in charge for that?

Mr. MAXON. For the doubling of the capacity?

Mr. DAVIS. Yes.

Mr. MAXON. I do not know that we got an explanation for that. We did not ask for it. I would say in that case we assumed that the

force had been reduced, or had not been required as large as anticipated—one of the two. We did not go into that detail.

General WALSH. After the camp at Ben Guerir was built during the fall of 1951 when the crash program was still on, it was anticipated we would continue at a very rapid rate with the entire program. In 1952 we decided to go back to a normal construction program, to get out plans and specifications before we went into construction, and this resulted in a considerable reduction in force that was required to carry on the work. The decision to try to do much of it by subcontracting also reduced the number of American employees that were required there, and for that reason there was a reduction in the number of Americans at that base.

It might be interesting to add in connection with that particular housing area that we have recommended to General Old of the Air Force, and General Old in turn recommended to the USAF, that that entire construction camp be considered as the housing required on the base for one wing, and in that way it will not be necessary to build a considerable amount of housing that was originally programed.

Mr. RILEY. This housing which has been recommended for use by the Air Force, is that comparable to the usual 10-year construction on Air Force bases?

General WALSH. It is exactly identical with what we are providing at all other bases—the Dallas huts, the latrines that are made out of either Quonset huts or by the use of concrete blocks. The mess hall is a H-shaped affair made out of large Quonsets, which is exactly similar to some of the ones at Sidi Slimane. It is comparable in all respects to what we had authorized and planned to build, but just in a slightly different area.

Mr. RILEY. That was going to be my next question; whether or not it was to be located the way that it could be utilized properly by the Air Force.

General WALSH. It is located where General Old felt it would be entirely satisfactory.

General NOLD. That is not the type of 10-year construction for Air Force construction within the United States. You remember the question of the 10- and 25-year life. This is different construction from that.

Mr. RILEY. But these are good, usable, living quarters?

General NOLD. Yes.

General PICK. It is the same stuff that we are building at Sidi Slimane.

General WALSH. It is exactly what the line items authorization which is for hutments.

HOUSING DEVELOPMENT AT NOUASSEUR

Mr. DAVIS. Did you observe the housing development at Nouasseur when you were there?

Mr. MAXON. Do you mean that for the Air Force or for the contractors, again?

Mr. DAVIS. For the construction force.

Mr. MAXON. Yes.

Mr. DAVIS. What comment would you make with respect to its appropriateness, both as plainness, or unplainness, and the spacing of the housing at the development?

Mr. MAXON. There are two construction force camps at Nouasseur. One is that for the construction forces on the Nouasseur base and the other for the headquarters forces. They are different types.

With respect to that in the construction camp, they are standard. They are satisfactory. The camp is clean. We walked and drove through the camp. We visited the barber shop and the store and the commissary. They are clean, orderly, and well kept.

I would say the whole camp meets the standards for that type of thing.

With respect to the other part of it, the central base, it is perhaps a little more elaborate than the other. The spacing is a little farther apart, but it perhaps has greater usage in the over-all program. It has to provide some quarters for families where there are single people in the construction camp.

Mr. DAVIS. Your over-all statement with respect to the latter would be, would it, that these housing facilities were quite in line with what you are familiar with on other overseas construction projects of the United States?

Mr. MAXON. For temporary purposes, yes.

Mr. DAVIS. Not unduly fancy or unduly expensive or unreasonably spaced?

Mr. MAXON. I think that is a rather broad question with a good many phases, but in a general sense I find no fault with the spacing, with the character and type of it. After all, a part of the inducement to get good men to go to an overseas base in an isolated area is adequate housing for his family, and a part of that adequate housing control is reasonable spacing of those houses. So they have to have adequate spacing so that they will not be living in each others' back yards, and I do not think there is anything unusual there.

Mr. DAVIS. Are you in a position, Mr. Maxon, to make an independent estimate as to the cost of the repair work on the runways and aprons and taxiways at Nouasseur and Sidi Slimane?

Mr. MAXON. No, sir; not without further investigation and a very comprehensive study.

Mr. DAVIS. Was that not within the purview of your assignment, or was the timing of your visit not conducive to your being able to give us anything?

Mr. MAXON. According to my interpretation of our assignment, it was definitely excluded therefrom.

REPORT TO CHIEF OF ENGINEERS ON PROBLEMS RELATING TO MOROCCAN PROJECT

Mr. DONNELLY. The intention of this committee throughout has been objective and complete record, hitting not just the high spots or the low spots, or the criticisms or the credit which is due, but considering everything in order that the committee can arrive at a considered judgment at the conclusion of these entire hearings.

With respect to that, the committee has before it a letter dated December 27, 1951, from Brig. Gen. Robert G. Lovett, division engineer for the East Ocean Division, addressed to Lt. Gen. Lewis A. Pick, Chief of Engineers. It is classified as secret, security information; however, excerpts from this letter have already been published—paragraphs and portions of it.

It is the wish of this committee that the matters raised in this letter be placed before all those present here with the opportunity overnight to consider the type of statements made therein so that you may be prepared to make any explanation or observation or statement in mitigation or extenuation that may appear appropriate.

Is it proper at this time to read the letter?

General HARDIN. Yes. The Office of Classification is the East Ocean Division, and I have the authority of the division engineer to declassify the letter. However, it has an enclosure to it from General Old, who commands the Fifth Air Division in Morocco, and I have no authority to declassify that. If it could be omitted and maybe the substance of it mentioned, I think the problem could be obviated.

Mr. DONNELLY. Your suggestion about that General Old's letter is helpful because actually General Lovett encloses copies of two letters that General Old had addressed to Colonel Derby. Both had to do with funding and line item justifications and do not have a direct bearing upon the contents of General Lovett's letter to General Pick.

I would like, if I may, to read this letter of General Lovett, and everyone can think it over tonight and figure what response they desire to make tomorrow.

(The letter was read, as follows:)

CORPS OF ENGINEERS, UNITED STATES ARMY,
OFFICE OF THE DIVISION ENGINEER, EAST OCEAN DIVISION,
Richmond 19, Va., December 27, 1951.

Lt. Gen. LEWIS A. PICK,
Chief of Engineers,
Department of the Army, Washington 25, D. C.

DEAR GENERAL PICK: At the division engineers' conference on December 6–7 you indicated that you would like to have a personal monthly letter from each division engineer telling you of some of the current troubles. I have just gotten back from Casablanca where I spent more than a week with Colonel Derby and the contractors, observing all the work in progress and meeting with General Old and the American consul general. There are many difficulties facing us in Morocco and it is going to take an all-out effort on the part of everyone concerned to fulfill our job there satisfactorily. I will cover the most important difficulties in separate paragraphs below.

1. *Army Audit Agency.*—The first person I talked with upon arriving in Casablanca was Colonel Ivins, inspector general. Colonel Ivins had been there about 3 days when I arrived and stayed until I left. Colonel Ivins' findings were substantially as follows:

(*a*) The Army Audit Agency had been doing the best it could with the personnel it had, but it was so seriously understaffed that he considered the situation to be "explosive." They were far behind in their auditing and were getting further behind each day. He told me that he considered the situation to be so serious that he was writing a letter direct to General Craig, the Inspector General, asking that the Army Audit Agency personnel be immediately supplemented.

(*b*) I asked Colonel Ivins specifically if he had found any evidence of fraud on the part of the contractor. Colonel Ivins said absolutely not. He said that there had been several instances of minor fraud on the part of individual employees, but there was nothing to indicate that the contractors as such were in any way involved.

(*c*) Colonel Ivins further stated that the matters of administration and property control on which the contractor had been very bad at the start were improving rapidly and that because of this improvement he was not going to stress them in his report.

2. *Atlas Construction Co.*—Atlas Construction Co., and by this I primarily mean Morrison-Knudson, has done an even sloppier, more inefficient job than anyone in OCE has previously realized. Not only was their administrative work poor, but in many instances there was a complete lack of supervision on the job. The conditions of loafing and complete lack of supervision were so bad that

Colonel Derby had a number of inspections made to reveal the conditions. I am enclosing a few of these reports (enclosures 1, 2, and 3) for your information. The one good thing that can be said is that within the past 30 days there seems to have been considerable improvement in morale and a desire to do a job on the part of the contractor's personnel. Colonel Derby though needs additional competent personnel without delay in order to check on the contractor's performance and to eliminate the waste to which both the contractors and architect engineers are prone.

3. *Architect engineers.*—The architect engineers, while fully competent, are prone to recommend the most expensive possible method of doing the job and seem reluctant to spend the necessary time on alternate locations or methods which can materially reduce the cost. As an example of this, Colonel Derby's staff, by checking and adjusting the architect's plans, saved some 200,000 yards of excavation at Noussauer.

Another current example is at El Jemma Sahim where the runway is located on clay, the architect engineers have recommended 5 feet of fill on top of this clay (they admit it might be cut to 4 feet) as the only method of insuring against settlement; 5 feet of fill over this tremendous runway means millions of dollars, and I am convinced that there are other adequate solutions which would be less expensive. A first-class soils man who could spend 6 weeks or 2 months with Colonel Derby would, I feel, pay tremendous dividends.

4. *Air Force.*—I talked at considerable length with General Olds, commanding the Fifth Air Division. General Olds has the highest regard for Colonel Derby and they have worked together very closely. However, General Olds was extremely critical of the contractor and felt that they were wasting money. He also felt that Colonel Derby did not have an adequate staff to supervise the contractor and prevent him from wasting money. I am enclosing copies of two letters of General Olds to Colonel Derby which Colonel Derby had just received when I arrived. I believe the content and tone of these two letters will indicate the position which the Air Force is beginning to take.

5. Relations with the French liaison mission clear all procurement causes some delay in procurement of essential materiels. However, Colonel Derby seems to have a very good working relationship with them. At the present time, one serious complication is on the matter of subcontracting. The French mission is insisting that on any subcontracts the contract be between Atlas and the French contractor and that the United States not be a party thereto. In the event of any disagreement, the French contractor would go to a French court for settlement. I talked at length with the consul general, Mr. Medonne, on this. Mr. Medonne's view, as well as Colonel Derby's view, and my view are that under no circumstances can we agree to such an arrangement. A French subcontractor under such a set-up could prolong the work for 8 or 10 years. Under the existing treaty, we may have to eliminate subcontracting and require Atlas to do all of the work rather than agree to the French plan.

6. *Movement of dependents.*—In my opinion it is absolutely essential that the movement of dependents be authorized. Colonel Derby has inadequate strength to perform the necessary supervision. If he does not perform the necessary supervision, the job may blow up in our face or, at best, the costs will be excessive. The entire matter of increased strength has so far hinged upon the movement of dependents. When I took over the office here, we had 17 tentative personnel lined up for Colonel Derby. When we could not give these people a commitment for the movement of their dependents all of them either turned it down flat or lost interest and drifted on to other jobs. The situation with respect to the contractor is the same and I have received a lengthy telegram from Mr. Bonny requesting authority to move dependents to Morocco. Regardless of whether or not the Air Force concurs, we have a job to get done and we must have control of the means with which to do that job. I, therefore, feel it is essential that the movement of dependents to Morocco be authorized immediately.

R. G. LOVETT,
Brigadier General, USA, Division Engineer.

I understand that Atlas has never seen this letter for the reason that it has been classified secret, and I will undertake to have copies run off if you gentlemen desire to have a copy this evening to consider this matter.

Mr. RILEY. The committee will recess until 10 o'clock tomorrow morning.

FRIDAY, SEPTEMBER 19, 1952.

QUALITY OF CONSTRUCTION OF AIR BASES IN FRENCH MOROCCO

ADDITIONAL WITNESSES

EDWIN V. HUGGINS, ASSISTANT SECRETARY OF THE AIR FORCE
O. J. PORTER, DEPUTY CONTRACT DIRECTOR, PUSOM
J. WALTER SEVERINGHAUS, CONTRACT DIRECTOR, PUSOM
A. C. STUDER, JR., ESQ., COUNSEL FOR PUSOM

Mr. RILEY. The committee will please be in order. I shall ask Mr. Donnelly to proceed with the inquiry.

Mr. DONNELLY. The record should show that all the witnesses who were present yesterday are also present today. Mr. Maxon, you indicated this morning that you would like to clear the record with respect to opinions you expressed yesterday on the quality and scope of the work performed in Morocco. The committee will be pleased to hear any statement you care to make, sir.

Mr. MAXON. Thank you, Mr. Donnelly. I was asked the question as to whether or not I considered the Secretary's charge to include certain technical studies. I have stated I definitely did not consider it to include those; but rather definitely considered it to exclude them.

Now I would like to state why I made that definite statement, since it is a matter of interpretation of the Secretary's letter. Prior to acceptance of the responsibility to make this survey, I had considerable discussion of the phases of it with Mr. M. E. Kollett, consultant in the Secretary's office. During the initial stages of that group of discussions, I specifically stated that I could not take any part in the survey if two questions were involved: First, if the survey was to include detailed estimates of quantities of work or the cost of those quantities of work, and, second, that I did not wish to enter into any obligation for a review of the technical engineering problems, such as the adequacy of specifications, or the question of whether or not the work did conform in all details to those specifications.

I did that because, in the first place, the making of an adequate estimate of volume of work and the cost thereof is quite a lengthy process. So far as I was personally concerned, and those people with whom I expected to be associated in this survey, I knew that they could not give that much time, the time necessary to do that work. So far as the engineering studies were concerned, I did not feel that they were properly in the province of the construction contractor, whether he was an engineer or not; that is, to engage beyond his professional work.

So that the stipulation was made to Mr. Kollett that if those things were to be included in our charge I could not be connected with it.

I just wanted to make that clear by my own stipulation rather than by an interpretation of the Secretary's letter. Thank you.

Mr. RILEY. Thank you, Mr. Maxon. I think the committee understood the matter, but we are glad to have this clarification of it so that there will be absolutely no misunderstanding of your position.

Mr. MAXON. Thank you.

Mr. RILEY. Mr. Donnelly, you may proceed.

Evaluation of Final Tests of Construction and Corrective Action Needed

Mr. Donnelly. Mr. Chairman, this morning the committee is pleased to have before it Mr. Huggins, Assistant Secretary of the Air Force. Yesterday the Air Force was represented by Mr. Perry, the Deputy for Installations, and it had been the committee's desire that Mr. Huggins be here today to hear the testimony with respect to the evaluation of the final tests of construction and the corrective action needed, if any, as well as the extent thereof.

Mr. Riley. We are delighted to have Mr. Huggins here to hear this presentation.

Mr. Donnelly. Also we have here today Mr. Porter, of the firm that is one of the members of PSUOM, the architect-engineer.

Source of Decision for Completion of Nouasseur and Sidi Slimane to a Limited Extent Operationally by July 14, 1951

Before we go into the final tests and the necessary corrective action, I would like to ascertain from the Air Force whether the completion of Nouasseur and Sidi Slimane, the two bases, to a limited extent operationally by July 14, represented a date that was desired and needed by the Air Force.

In fairness to Mr. Huggins I would like to state by way of background that Mr. Perry on July 2, 1952, testified that the Air Force had no idea as to where the July 1 date for completion of any of the work came from; and in that testimony I referred him to a letter written by Major General Timberlake, of the Air Force, dated January 10, 1951, requiring that four of the five bases reach a ready date of July 1, 1951.

Mr. Perry indicated that he had just muffed that letter; that he had missed it completely.

There has been a public statement made recently that Colonel Derby was apparently the one solely responsible for the decision to make the two bases, Nouasseur and Sidi Slimane, operational to a limited extent so that on July 14 a flight of Air Force planes landed at both bases.

The committee should like to know from the Air Force whether that decision to have the bases operational to that limited extent on July 14, 1951, was in keeping with the decision and the needs of the Air Force.

Mr. Huggins. I think, Mr. Donnelly, that the Air Force wanted those operational just as quickly as they could get them. In the state of confusion that existed at that time I would say that it is probably a little difficult to put your finger on any one individual and say that he was responsible for it.

In reference to the General Timberlake letter of January 10, we had heard there was such a letter. We hunted all through the files and actually this is the first time I have had such a provision read to me.

The initial directive of November called for the bases to be operational within 6 months after the equipment was admitted to the country. I think in everybody's mind the date of July 1 became fixed because they expected to get in on January 1. As we all know, they did not get in on January 1, but the date of July 1 remained fixed in

everybody's mind and, to the best of my knowledge—and I have tried to inquire both here and abroad as to whether there was any specific direction to complete them by July 1, or to change that date—the specific date was never discussed once entry was obtained.

I think the Air Force was delighted at the thought that they could get in in July. Certainly we did nothing to say "Slow down" if a slowdown were in order.

My guess is—and it was largely a carry-over of a state of mind—that maybe somebody should have stopped, in view of the 4 months' delay in getting in there, to take a review of the situation and say, "Well, forget the July 1 date; pick up some place else," but that was not done.

Mr. DONNELLY. I do not want to take advantage of you here with respect to testimony on this matter, but you indicate that the July 1 date was decided upon assuming entry would be had by January 1.

Mr. HUGGINS. That is right.

Mr. DONNELLY. And the Air Force did not review the situation after entry had been obtained and readjust the target dates for completion.

Mr. HUGGINS. So far as I know, nobody reviewed it.

Mr. DONNELLY. We have here a directive from USAFE—United States Air Force in Europe—headquartered at Wiesbaden, dated April 9, 1951; that was the date on which the district engineer was given a written directive by the 9ir Force to proceed with the construction of these bases. This is addressed to the district engineer and it says:

1. The below-listed projects are furnished to serve as a guide in establishing priority of construction for accomplishment within the over-all base-development plans in French Morocco. The primary objective of establishing these priorities is to achieve minimum operational facilities at the earliest date possible:

a. Fighter base—

Then it has listed the date August 1, 1951.

The specific locations for the fighter base, as I understand the program now, would be Boulhaut and El Djema Sahim.

Mr. HUGGINS. That is right.

Mr. DONNELLY. Here we have the Air Force on April 19, 1951, laying out the requirement for the fighter base to be operational by August 1, 1951. This is a classified letter or a secret letter, or I would put it in the record.

It specifies the dimensions of the runway; the aircraft parking; the Avgas storage, and the like.

Let us pass over to "b" where it lists the projects for each bomber base, for the date of August 1, 1951, giving specifications again; the dimensions for runway, aircraft parking, Avgas storage, warehouses and shops, and so forth.

It mentions specifically the runways for the bomber bases; 9,000 feet by 200 feet, and at Ben Guerir 11,000 feet by August 1. And by October 1 the runways were to be extended so that at Ben Guerir they would be 13,000 feet and the other bases 11,000 feet.

Then we have the depot at Nouasseur, again with the dimensions of the runways and other paving, and an outline of other facilities desired, again by August 1, 1951.

The reason that I have asked the question is that there has been considerable confusion in the matter; that the Air Force was equivocating in congressional hearings on the matter in the past; and the record also shows that the contractors, the Corps of Engineers and the architect-engineer built to a limited operational extent by July 14 two bases, the one at Nouasseur in 83 days and the second base at Sidi Slimane in 64 days; and that these same men are building the balance of the bases and are still working for the Air Force.

I just wanted to note for the record that what they had done by July 14 was actually in keeping with the wishes and the needs of the Air Force.

Mr. HUGGINS. Let me just speak to that. It is the Air Force's fault that we do not have that document here. I had not known about it. But, insofar as a 6-month period for construction was set, that was based upon conferences between the Air Force and the Corps of Engineers. The Air Force is not a construction agency, has no background of knowledge as to what can be done within a given time. I would doubt somewhat in my own mind that we would give a directive—I cannot speak specifically to that—that we would give a directive saying, "Complete something by a given date" unless we had had some information that it could be done by that date. Certainly the initial directive was based upon a conference between top Air Force people and top Corps of Engineers people. Therefore, I express at least a doubt that the dates in that directive were pulled out of the air by the Air Force without consultation with somebody. But I cannot speak to it because I know nothing about it. Certainly it would be quite contrary to normal practice, and I think we would also expect the Corps of Engineers to tell us, if they could not do the work properly within that time, that the dates were unrealistic.

Mr. DONNELLY. May I ask you this question, Mr. Huggins? Does the Air Force feel that the district engineer should be criticized for having had the two bases operational to a limited extent on July 14?

Mr. HUGGINS. The Air Force feels that he should be criticized for not telling us that they could not be built under the specifications within that time. And, so far as I know, that was not done. We never authorized deviation from specifications, so far as I know, and I have tried to check on that point very carefully.

RELATIONSHIP BETWEEN AIR FORCE AND CORPS OF ENGINEERS

Mr. DONNELLY. Mr. Huggins, Mr. Perry also testified when he was here on July 2 to the relationship of the Air Force as the customer and the Corps of Engineers as the construction service. I should like to read his testimony and ask you whether it reflects the Air Force position:

> At the outset, I think it is extremely important that we understand the nature of the relationship between the Air Force and the Corps of Engineers. This relationship is spelled out in agreements between the Departments of the Army and the Air Force. These agreements describe the responsibilities of the Corps as, first, providing technical assistance in preparation of master plans; second, execution of designs and preparation of preliminary plans outlined in specifications and cost estimates; third, administration and on-the-site supervision of the construction; and, fourth, providing the Air Force with periodic progress and fiscal reports.

The same agreements describe the responsibilities of the Air Force as, first, determination of its construction requirements and defense of its requirements within its budget estimate; and, second, stating generally its requirements for construction in terms of space lay-out, architectural style, characteristics of operations and equipment to be accommodated, degree of permanence, and such other details as are necessary to enable the designer to proceed in accordance with Air Force qualitative and quantitative requirements.

Obviously, such a relationship requires a considerable degree of cooperation. This, in turn, makes it difficult to determine, in actual cases, where the responsibility of the Corps of Engineers begins and the responsibility of the Air Force ends. I think it is evident, however, that the Air Force cannot supervise actual construction and that the Air Force must rely upon the Corps for the quality of the construction and for the exercise of a sound judgment as to the cost of construction. If the Air Force attempted to supervise construction and costs on any detailed basis, it would be compelled to create an engineer corps of its own, thereby bringing about the very duplication which the Army-Air Force agreements were designed to avoid.

Certainly, the Air Force has the duty of providing the corps with all the information necessary to draw the plans and specifications for, and carry out, the construction set forth in Air Force construction directives. By mutual agreement, the actual preparation of master plans for the Moroccan bases was a responsibility accepted by the corps, which, in turn, contracted the work to the architect-engineers. The Air Force has the right to approve all master plans in order to insure that they satisfied Air Force requirements.

Mr. Huggins, let me hand that to you; it is quite lengthy.

Mr. HUGGINS. I think that is a generally fair statement.

Mr. DONNELLY. Do you agree with that statement, General Pick? Would you like to look at it?

General PICK. I would like to look at it.

Mr. HUGGINS. I might add I have no specific recollection in the case of Morocco that the corps was to have charge of the master plans. Normally the Air Force provides the master plans. But it may be that there was a special deal on that. Certainly the same architect-engineers were doing both the master planning and the detailed planning.

General PICK (referring to testimony of Mr. Perry). I think that is in general a correct statement.

NATURE, QUALITY, AND VALIDITY OF TESTS AND PROCEDURES USED IN FINAL STUDY AND DETERMINATION

Mr. DONNELLY. So much by way of background of the interrelationships of the Air Force and the Corps of Engineers, and the role of the architect-engineers. We now come to the extensive months-long evaluation tests which were studied at Morocco, as I understand, in the latter part of August of this year. They were interpreted and a determination was then made by representatives of the Corps of Engineers, headed by General Pick, by the Air Force, by the architect engineers, headed by Mr. Porter, and by Atlas Constructors, as to the extent of the weaknesses or deficiencies in construction and the scope of needed corrective action.

In that respect, General Pick, would you give the committee a statement as to the nature of the tests, the period covered, the quality of the tests, the validity of the tests, and the procedures employed in the final study and determination?

General PICK. Mr. Chairman, I would like to review a moment the preliminaries leading up to the studies which have been referred to by counsel.

REVIEW AND STUDIES OF MOROCCAN PROJECTS BY CHIEF OF ENGINEERS

In the early part of October of 1951 it was brought to my attention that conditions were not going too well in north Africa. I could not go myself; so I sent General Nold, the Deputy Chief of Engineers, to north Africa, in the middle of October, to review the situation and make recommendations. The administrative and organizational problems over there were such that I thought it was necessary to look into them.

General Nold made a report to me when he returned. He actually reported to me over the telephone from over there. As a result of his report it was decided to do some reorganizing on our part, so I established a new division and set up the headquarters at Richmond, Va. I put the work under that division, and took it out of the New York division office.

As a result of that trip of General Nold and the reports which I had from our former division engineer, and the new division engineer, I had meetings with the members of the contracting firm of the Atlas Contractors and the officials of Atlas Contractors' firm and in the latter part of December I decided to make a trip to north Africa to see for myself.

Prior to my going I sent two of our experts, Mr. Philipe and Mr. Pringle, over to north Africa to look into the construction features and to determine the character of the work.

I made a trip out there in January and returned in February. As a result of that trip and the technical studies we had started, I directed that they be continued, and I had that included in a report which I submitted to the Secretary of the Army—a memorandum report to the Secretary of the Army—on the 6th of February 1952. And in that report I stated that——

> There are exhaustive studies being conducted to determine whether or not the pavements which were rushed to completion in 1951 are fully responsive to the design criteria. If these studies show a need for additional treatment to insure the long life and low maintenance cost of the work, I believe that it will be a relatively minor undertaking. The completed work has been thoroughly tested with the heavy roller and no weak pavements were found—

That was the condition that I observed when I was there in February.

Mr. Chairman, I should like to insert a copy of this report of February 6 in the record at this point.

Mr. RILEY. Without objection it will be inserted in the record at this point.

(The document is as follows:)

FEBRUARY 6, 1952.

Memorandum for the Under Secretary of the Army.
Through: Assistant Chief of Staff, G–4.
Subject: Visit to Middle East and Mediterranean areas.

1. Reference is made to letter dated February 4, 1952, from Office of the Under Secretary of the Army, subject: "Corps of Engineers Construction Contract ——," in which request was made for a report upon the completion of my visit to Morocco.

2. There is attached a memorandum report on these projects which both points out the evaluation of the operations and also indicates the steps which have been taken to improve performance.

LEWIS A. PICK,
Lieutenant General,
Chief of Engineers.

FEBRUARY 6, 1952.

Memorandum for the Secretary of the Army.
Subject: Visit to Middle East and Mediterranean areas.

1. I have just returned from an inspection of our overseas construction for the Air Force in the Middle East and Mediterranean areas. In view of the recent publicity given the work in Morocco, I hasten to report my views on these projects.

2. I did not find corruption, willful negligence, widespread inefficiency, or organized effort to defraud. I did find some improper procedures and even some serious deficiencies which have not been entirely unkown to us, but for which correction has not yet been made. In a few instances, contractors' employees have been arrested and convicted of illegal acts, and even now a contractor's employee is being arraigned for trial on the accusation of a fellow workman for influencing a procurement action in the local market. Considering the number of men employed, the nationalities involved, the conditions under which the work was carried on, I seriously doubt that the few minor dishonesties uncovered are any more than might have been expected. I know of no instances where any major frauds have been discovered.

3. In weighing the past shortcomings and present deficiencies of these operations, some consideration should be given to the many contributing factors involved, many of which could not reasonably have been foreseen. The constructors, each of whom have a good national reputation, have been restricted in the scope of work, planning the operations and advance procurement from the beginning. Lengthy delay in the acquisition of the sites, changes in the scope of the program, problems arising from working under the French agreement, have all contributed to the unusual nature of the task. The great urgency attached to the prosecution of the work led, in no small measure, to inefficiency, to improper control in the best utilization of labor and, in some instances, slighting adopted standards in construction.

4. In trying to meet the emergency requirements of the so-called crash program, some construction practices associated with the runway and apron work were adopted which would not be acceptable in a normal situation or in the United States where required resources in skills and equipment are generally available as needed. However, none of the runways or completed aprons have failed, even though there have been many reports to the contrary, and I can assure you that there is no danger of any completed work failing under operating conditions.

5. The operations apron at Nouasseur was partially surfaced when rains caught them with an excessive area exposed to the weather. Moisture penetrated the uncompleted pavement, only the binder course having been laid, and the engineer in charge decided, in accordance with standard procedures, to test the supporting capacity of the work in that condition by heavy rolling before resuming the pavement operation. The 200-ton roller developed the presence of some areas where moisture in the base had seriously affected the supporting values and the partially completed pavement in these locations was ruptured. It should be noted that these were failures induced by testing during the construction period and not by the operation of aircraft. The test was a severe one, the weight and tire arrangement of the testing roller produces a load that exceeds by approximately 50 percent of the wheel loading of the B–47. The purpose of locating such weak spots is to enable corrective measures to be undertaken by the construction forces rather than to have deficiencies show up later during the maintenance period. This procedure is now standard in the construction of heavy duty airfields or highways in the United States.

6. There are exhaustive studies being conducted to determine whether or not the pavements which were rushed to completion in 1951 are fully responsive to the design criteria. If these studies show a need for additional treatment to insure the long life and low maintenance cost of the work, I believe that it will be a relatively minor undertaking. The completed work has been thoroughly tested with the heavy roller and no weak pavements were found except in a small area on a taxiway at Sidi Slimane which has now been corrected.

7. I personally investigated reports of poor construction practices used in the plumbing installed in some twenty-odd latrines at Sidi Slimane, only to find that emphasis had been put on this incident which was all out of proportion to its importance. In order to accommodate the troops with limited camp facilities not contemplated in the original program, connections were made by temporary means as a convenience until the fittings, especially traps for the wash basins, could be procured. Although it was the view of the area engineer that the work was adequate for the type of structure and contemplated life (10

years), at the request of the Air Force Station Commander steps have been taken to install standard fittings that are now available.

8. During this inspection trip, members of my staff examined the current cost-keeping procedures and found them to be generally satisfactory, although some posting of material charges to individual features had lagged unduly. Data was prepared on costs to date and an estimated distribution of deferred charges was prepared for the purpose of meeting current needs of the Air Force. Although the over-all cost of the work to date can be assumed to be accurate, and has been reported for previous periods, detailed cost figures by line item must be used with caution and understanding because few, if any, items are complete and the distribution of deferred charges will be affected by various considerations until the entire program approaches completion. Costs incurred to date are believed to be reasonable when viewed in the light of the conditions surrounding the undertaking and appear, at this time, to be in line with estimated costs.

It should be noted that the total Air Force program in Morocco is still not firm. The latest revisions were made to reduce the authorized scope of work to conform to appropriated funds. It is not possible to design many of the facilities due to a lack of criteria which must be furnished by the Air Force even for the work in hand. Estimates of costs based on indefinite requirements must necessarily be based on general experience.

Master plans for the last three stations selected have not been finalized and approved. In the case of Ben Guerir, the plan was approved, but in the last week approval was withdrawn because of contemplated extensive revision to meet new policies on dispersion. Master plans for the other two stations have not been completed. If excessive costs and loss of time in labor and equipment are to be avoided, these plans must be agreed upon without future delay. Without a plan, it is manifest that the final cost of grading, paving, and utilities cannot be determined with any degree of accuracy.

9. During and prior to this inspection, steps were taken to improve the performance of both the architect-engineers and the construction contractors. Improvement in organization in both has been effected in recent months and further improvements are being required. Steps have been and will continue to be taken to strengthen the Corps of Engineers' forces as the need arises. Now that the emergency aspects of the Air Force program have been met, planned business-like procedures can be followed more closely and overtime eliminated or reduced to a minimum. There is still much room for improvement in the handling of labor and the safeguarding of materials and equipment. The use of native labor and the preventing of pilfering present unusual problems. Positive action to control and eliminate deficiencies in this field will be continued.

10. Although economical operation has not always been achieved in the past, as indicated above, I believe that much improvement will be made under the new concept of a lesser urgency, the improved organization, and the improved supervision provided in recent months. In general, I believe that deficiencies in these operations have been exaggerated, and certain engineering aspects have been misunderstood and distorted. There should be no concern that a dependable facility will be available to the Air Force upon completion.

LEWIS A. PICK,
Lieutenant General,
Chief of Engineers.

General PICK. Those studies which had been started prior to my report, and studies which I urged be continued by the division engineer on the ground, with whatever assistance we could give from my office by Mr. Philippe and Mr. Pringle, were continued. They covered the entire range or entire field of the pavement work that had been done during the 1951 program. Exhaustive studies were made; laboratory tests were made; field tests were made; and the results were analyzed over the period extending from the early part of the year of 1951 to 1952, through the spring and summer.

I asked the division engineer, General Walsh, to notify me when those studies had been completed to such an extent that he could draw conclusions. Those studies were being carried on under the direct supervision of the architect-engineer, Mr. Porter's group, followed

very closely by the district engineer organization and the division organization; and in July I sent Mr. Pringle and Mr. Philippe over there to review the work which had been done up to that time, because I wanted to be sure that it was finished as early as possible so that any remedial work which would be necessary could be accomplished during the working season of this year.

Mr. Pringle and Mr. Philippe returned around the middle of July and brought back a considerable amount of information with them on the tests which had been made up to that time; and they had studied that data with the people in the field. They brought it back to my office, and I had it thoroughly studied there. I had it analyzed. I gave a considerable amount of my personal attention to it. We had gone into it very thoroughly.

Then I sent a radio to General Walsh wanting to know when he thought I should come. I got a notice back setting a date that I could come in August. I arrived in Casablanca on the afternoon of the 11th of August.

Mr. RILEY. That is this year, sir?

General PICK. This year; yes, sir.

The following morning I had a meeting at the district office at Nouasseur. Represented there was General Walsh, with people from his division office; Colonel Campbell and people from his district office; Mr. Porter and people from his office.

We reviewed the data very thoroughly. I had already asked prior to going out there that the division engineer ask Mr. Porter to prepare a program for any remedial work which he thought would be necessary in connection with the pavement and to prepare estimates of what he thought it would cost.

When I arrived there I had the meeting of the 12th, and we went into the test data; we went into the program which Mr. Porter had recommended; and it was concurred in by the district and the division office. General estimates had been prepared. We discussed each piece of pavement that we were concerned with individually. Then we considered it from an over-all standpoint as to whether or not remedial work could be done in conjunction with Air Force operations without causing any very great interruption in their operations.

I found that that also had been discussed with the Air Force by General Walsh, and I found that there was general agreement with the Air Force as to whether or not that would be possible.

The day was spent in discussing these things. At that time I asked Mr. Porter for a definite estimate as to the cost of the work and the program which he recommended, and asked him to have it for me by Thursday night.

The next day we went to Rabat. I went over the program which we had discussed the day before with General Old. I told him what in general appeared should be done: that the final decision had not been made but that it seemed evident that that was what would be necessary and that we wanted to carry out the operations to the best advantage of all concerned and certainly in such a manner as to not interfere with the Air Force operations any more than was necessary.

General Old said that he had discussed these remedial measures with General Walsh and he figured that they could be carried out without too much interference with the program:

I said: "Now, I do not know exactly what they are going to cost, because we are refining the estimate and I will not know until we get back Thursday."

General Old expressed the opinion that he thought that the program as worked out was all right and that it could be carried out without too much interference to the Air Force.

We then went and reviewed the work at Sidi Slimane and Ben Guerir.

On Friday of the week we came back to Nouasseur and went over the work there again. We had gone over it on the 12th. We went back over it again. We inspected not only the work which had been accomplished at both of the fields in 1951, but all work which had been done and was being done since that time at those bases. I was highly pleased with the work which was being done on the runways and taxiways and the building work at the two bases.

On Friday we had a meeting in the district office at Nouasseur, and we again discussed the remedial program. I had Mr. Porter and his group and I had people from Atlas Contractors with me on the trip to the air bases. We had been talking it over all the week with the contractor, the architect-engineer, the district engineer people, and the division engineer people, and I discussed the questions with the air base commanders and the people that we met at the air bases—both of the bases.

On Friday we had the meeting at Nouasseur and we worked out a program which could be carried out partially this year and partially next spring which would provide remedial work necessary to bring the pavement work up to the standard which would give the life which was considered necessary.

When I returned to the States I wrote a report to the Secretary of the Army on this particular activity in which I outlined to him a program of work over there and what it was going to cost. While I was there I learned that there was some question as to whether or not we could start the work this year, because of a limitation of funds which had been indicated to General Old over there by the Assistant Secretary of the Air Force, Mr. Huggins, who is present here today; because it was Mr. Huggins' understanding from the committee of Congress with which he was dealing that certain funds which would be made available to the Air Force could not be used for this particular purpose.

The report which I submitted to Mr. Pace, dated the 20th of August 1952, is here; and, Mr. Chairman, I should like to present that to the committee at this time and ask that it be included as a part of the record.

Mr. RILEY. Without objection this report will be incorporated in the record.

(The document is as follows:)

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF ENGINEERS,
Washington, August 20, 1952.

Memorandum for the Under Secretary of the Army.
Through: The Assistant Chief of Staff, G–4.
Subject: Moroccan Air Bases.

1. There is attached a memorandum report on my recent visit to the air-base construction projects in Morocco.

LEWIS A. PICK,
Lieutenant General,
Chief of Engineers.

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, August 20, 1952.

Memorandum for the Secretary of the Army
Subject: Moroccan Air Bases

1. Reference is made to paragraph 6 of my memorandum dated February 6, 1952, subject, "Visit to the Middle East and Mediterranean Areas," wherein I stated that studies were being conducted of the Moroccan air bases then under construction, to determine whether or not the pavements which were rushed to completion in 1951 were fully responsive to the design criteria. Sufficient of these studies have now been completed to permit taking definite action. They included extensive testing of the pavements in their present condition in the aircraft utilization areas at both Nouasseur and Sidi Slimane, by field and laboratory procedures and by measuring the improvement which is possible to obtain by additional rolling, using the 200-ton pneumatic tired super compactors. Hundreds of tests were made of the supporting power of materials in place, moisture contents, and gradations. These tests were distributed in a manner to give representative results in all areas such as the aprons, runways, and taxiways.

2. I have made another visit to these sites and have completed a review of these tests. I am pleased to inform you that my previous estimate of the situation is confirmed, namely that any need for additional treatment to insure long life and low maintenance cost of the work would be a relatively minor undertaking.

3. At the time of my recent visit, all areas were operational—even the much discussed operations apron at Nouasseur is operational to the degree that it is currently being used by all types of MATS aircraft. However, deficiencies do exist which are, in my opinion, the result of the very rapid construction operations conducted during 1951. There is a need for completing the compaction effort, and in certain areas of the operations apron at Nouasseur as well as in the aircraft utilization areas at Sidi Slimane, there is a need for the removal of an indeterminate but proportionally small amount of defective material in soft spots in the base course. This defective material will be revealed by the rolling described above and might well be termed "dental work." It is agreed by all concerned in the architect-engineer organization and the Corps of Engineers forces that the completed pavements can be brought up to long life requirements by additional rolling, sealing of the asphaltic surface in certain areas, the use of a leveling course up to 1 inch in thickness where rolling will result in minor depressions, and by the use of an additional 1 inch thickness of dense asphaltic concrete in those areas which are frequently exposed to fuel spillage and jet blast. A brief description of the conditions and the treatment which I directed be accomplished in the several areas at each base, follows:

NOUASSEUR

Runway, taxiway, parking apron

Materials and moisture contents are generally satisfactory but long life under repeated loading will be improved by additional rolling. These areas are to be rolled with six complete coverages of the 200-ton compactor. No defects of the surpace are expected to appear, but if any do, necessary patching must be completed this season. After completing the rolling and necessary patching, a seal coat of hot asphaltic material will then be applied to these areas.

North warm-up apron and north refueling apron

These areas are to be rolled with six coverages of the supercompactor and surfaced with a dense layer, one inch in thickness, of asphaltic concrete in order to increase the resistance of these areas to fuel spillage and jet blast.

Operations apron

During the remainder of this season, known plastic areas will be stripped of the present asphaltic concrete surface (binder course), undesirable materials will then be removed and replaced with properly graded materials. The tests indicate that only a small percentage (not over 10 percent) of the entire operations apron will have to be treated in this manner, either now or as the result of next year's work.

In view of the fact that the water content in the subgrade, though slowly reducing, is generally too high for a complete rolling with a heavy compactor

at this time, completion of the surfacing of this area and the necessary repairs will be deferred until the summer of 1953. By deferring this work until the 1953 season, additional drying will take place and a maximum amount of the materials in place will be salvaged with resultant economy. When proper moisture contents of the subgrade are observed, additional compaction will make it ready for completion of the asphaltic pavement, the top course of which has never been placed.

SIDI SLIMANE

All aircraft utilization areas wil lbe rolled with six coverages of the heavy rolling equipment. This rolling will reveal where the upper portion of the base course is deficient and will also correct for any lack of compaction. Where deficient spots exist, they must be removed this year and the necessary patching completed prior to the beginning of the rainy season.

A leveling course, estimated to average between 1½ and 2 inches, of dense asphaltic concrete will then be placed to restore the surfaces to the required degree of smoothness and to provide additional strength and drainage. Final thickness of this course will depend upon a reevaluation of the compacted materials, but consideration of all aspects of the problem indicates at this time that the above estimated thickness of the leveling course will be sufficient to meet full operational requirements.

4. All phases of our proposed operations at Nouasseur and Sidi Slimane were discussed in detail with the Commanding General, Fifth Air Division, on August 13, 1952, and he concurred in every respect.

5. The estimated cost of this work must of necessity be approximate at this time. Final cost may be somewhat more are less but the variation will be minor mainly due to deviations from the assumed percentage of total areas which will require removal of undesirable materials, as demonstrated by the rolling operations. However, estimates have been carefully prepared by the architect-engineer and concurred in by the Corps of Engineers as being reasonable and conservative.

6. The estimated cost of the improvement work described above:

Nouasseur [1]:	
Operations apron	$278,836
North warm-up and north refueling apron	53,810
Parking apron, taxiway and runway	93,457
	[2] 426,103
Sidi Slimane	[2] 734,537
Total	1,160,640

[1] It should be noted that no additional expense has been incurred in the south refueling apron or the south warm-up apron, which have been completed under this season's program, and which are completely up to design requirements.
[2] Out of Pocket Cost.

7. The total estimated cost of paving the aircraft utilization areas at Nouasseur is slightly in excess of the line item authorization but is still well below the authorization plus 20 percent. By performing the additional work described above at an out-of-pocket cost of $426,103, this situation is not changed. However, at Sidi Slimane, the line item authorization will not be exceeded. I consider that these additional expenditures are moderate when viewed in the light of the magnitude of the undertaking and the highly urgent nature of the 1951 work which resulted in an operational facility after an extremely brief working period.

8. I am pleased with the current operations and the high quality of the paving now being placed. Throughout my inspection I sought the views of General Old and the Air Force base commanders, and they invariably expressed satisfaction with our present work and planned operations. Other operations of the contractor are being carried on in an efficient, business-like manner. There is still too much lag in financing this large undertaking, and as a result, procurement and planning cannot be performed to effect the greatest economy obtainable. Also, the fact that the remaining two sites have not been started and are still under discussion with the French, as to the respective shares of responsibilities of France and the United States, and the provision of additional real estate for the El Djema Sahim site, if not soon resolved will result in restricted operations

and will cause demobilization of the contractor's forces beyond the point considered desirable for the effective execution of the remaining work.

LEWIS A. PICK,
Lieutenant General,
Chief of Engineers.

General PICK. Mr. Chairman, in this report there is one statement I would like to call to your attention. That is that it was estimated by the architect-engineer that the remedial work at Nouasseur would amount to $426,103 and that at Sidi Slimane it would be $734,537, or a total of $1,160,640. That was given as an estimate which would not be considered as a final estimate, but it was considered sufficiently final at this time to be able to state that it could be used, although it was understood that as the remedial work was carried on the amount of remedial work in some instances could not be definitely determined at this time, so the cost might exceed that sum. Also, this cost was based upon the assumption that this would be out-of-pocket cost, and that is what it would cost to do the work at this time.

SCOPE OF TEST PROGRAM

Now, Mr. Chairman, the amount of work which was done in making the investigations and the tests was multitudinous. I should like to ask General Hardin if he would review briefly the test program which was carried out during the time which I have covered.

General HARDIN. Mr. Chairman, the tests were of a comprehensive nature, as General Pick has indicated, and the object was to determine the gradation of materials in place; moisture content of the materials; the plasticity indices; and other useful criteria to the engineers, including California bearing ratio tests, which I discussed with the committe last summer; all with a view to making an evaluation of the work which was in place. Something between 200 and 300 tests of this nature were made in selected places, which would give complete coverage of the areas under consideration.

The method of evaluating these tests was to review in detail the California bearing ratio results, which is the best indicator that we know of in connection with flexible-pavement design; reviewing these numerical values in connection with the gradation of the materials as determined by laboratory analysis, and endeavoring to find a constant relationship between the laboratory and field measurements; and to arrive at what we have as an average condition in the various selected areas for study. By that means we are then in a position to determine whether or not any additional thickness of pavement is required in order to meet the design criteria established in our Chief of Engineers' publications on the design of flexible pavements. The objective in this case is, of course, to provide a field which is termed "full operational." In building airfields we build them of three types. The first is the full operational, which means that the field will have a long life with only reasonable, minimum maintenance. The second category of field may be termed a limited operational field, where the period of usage is not likely to be more than 6 months. The third category of construction, called the emergency construction, is primarily that which would be used in the active field of battle or hostilities, where limited use is expected before the field is no longer of importance.

So our design objective in this case was to design for full operational characteristics. It was by this means of reevaluation of results and using our yardsticks of measurement that we would finally arrive at the required thickness.

However, I should like to point out that the laboratory tests and the in-place measurements had to be looked at objectively in this regard. Final determination would not be possible until the agreed-upon rolling procedures had been accomplished. It has long been our thought that the major amount of improvement of these aircraft utilization areas would result from additional compaction, which was not introduced in the original construction for one reason or another. But we would not be able to determine fully what the full benefits would be from this additional rolling until after the rolling were completed. That, generally, is in the process of being done now. In some areas it has been completed. In other areas this additional rolling is not yet completed, both at Nouasseur and Sidi Slimane. At the moment Nouasseur is essentially completed.

It was planned, however, that after the rolling was completed a final evaluation would have to be made to determine what benefits had been obtained by it, and then to reach a conclusion as to what thickness of paving would be necessary to be applied, if any, to the areas under consideration.

I will develop more at a later time where we stand at the moment, unless you decide to go into it now. Do you have anything to add to that, Mr. Philippe?

Mr. PHILIPPE. No, sir; not at this time.

Mr. DONNELLY. What use did you make of the Vicksburg Laboratory in these tests?

General HARDIN. The Vicksburg Laboratory as such was not utilized in this operation. We did use their equipment and had it shipped abroad in order to assist in making the California bearing ratio tests. I think some of their people were called in for consultation at some stage of it. It was Mr. Turnbull, I believe. I think that is all the laboratory participation.

Mr. DONNELLY. Did you dig test pits in the pavements, runways, and aprons, or did you take borings? In either case, did you do it while they were dry or did you saturate the construction?

General HARDIN. Well, Mr. Donnelly, the procedure for making the California bearing ratio test does require the digging of a pit. It is based on two approaches. One is in measuring the shearing resistance of the soil in its undisturbed state. A second method is used concurrently, of measuring the shearing resistance of the soil after the materials have been saturated.

Would you like to elaborate on that?

Mr. PHILIPPE. The question of the strength in its present state and a saturated state is certainly a pertinent question. To answer that we have to be very careful to run tests at both states. That is so that we can correctly judge the true value. That is known procedure and is always done.

General PICK. Was that done there?

Mr. PHILIPPE. Yes, sir; it was done in practically every test, for all practical purposes.

General WALSH. I might elaborate, in answer to your specific question. We did dig test holes in a great many places and took the mois-

ture content as found in those test holes at various depths up to 4 feet below the bottom of the base course.

General HARDIN. In order to use California-bearing-ratio equipment, we have to use a test pit. It is essentially a compression device which has a pedestal of a certain known area to stabilize the material you are testing. You have to remove the upper layers of the material and you thereby create a pit about 4 feet square. You take in that series of measurements not just one test with this compression device, but you take three in a pattern in that area of 4 square feet, in order to get an average value. So, it definitely requires a pit.

Mr. DONNELLY. Mr. Porter, are you familiar with the California-bearing-ratio tests?

Mr. PORTER. Yes; I am. During my soil work with the State of California, I devised and developed the tests in 1928 and 1929. They have since been widely used. I assisted the Corps of Engineers when they adopted the method in 1942.

Mr. DONNELLY. In the course of the test, did the corps by recurring pressure actually break down and destroy after an alternate period of pressure any particular pavement in your test, or did you construct any for that purpose?

General HARDIN. Well, the test does not require a load on the finished surface in the sense that you apply a compression test to the finished surface. That is done with this supercompacter, the 200-ton roller. But you have to destroy the pavement in this area where you are going to place the CBR equipment, because you have to take the bituminous surface out in order to get contact with the materials which you are going to measure in successive fashion down to the subgrade.

Mr. DONNELLY. Were the tests conducted at such points on all of the pavement on the two bases as to be more than a spot check, to be truly representative of the conditions of construction at every apron, every taxiway, every runway, and all representative portions thereof?

General HARDIN. When General Pick and I were there in February, a pattern of tests was established. Mr. Pringle and Mr. Philippe made the detailed plans for the testing procedure. That was our objective; to have a completely representative group of tests which would cover adequately all the areas.

General PICK. Did it?

General HARDIN. I think it did.

Mr. PHILIPPE. Yes, sir. The tests were selected to be in statistically adequate numbers so that no matter what came out we had quantities of numbers available so that they would be statistically significant.

CONFIDENCE EXHIBITED IN COMPETENCE OF THE TESTS AND THE PERSONS CONDUCTING THEM

Mr. DONNELLY. The report of the Maxon group indicates they had confidence in the competence of the personnel and agencies conducting the tests.

In the course of the tests, did the Corps of Engineers ever learn from the Air Force dissatisfaction with either the methods utilized in the tests or the personnel conducting the tests?

General WALSH. No. In fact, the deputy Air Force installations officer, Colonel Barnett, and Dr. Buchanan, consultant of the Air Force, who was over in July with Mr. Pringle and Mr. Philippe, both have expressed their confidence in the results of those tests.

Mr. DONNELLY. Mr. Perry, in his testimony of July 2 in the record which we have, also expressed his confidence in the competence of the tests and the people who were conducting them.

Mr. HUGGINS. Yes. I will confirm that. We had confidence that the tests being made were adequate and they covered the whole pavement area and were being presently done by competent people.

General PICK. Mr. Chairman, I should like to quote from the architect-engineer's report—Mr. Porter—to me in part, which reads as follows:

This report is based on the detailed evaluation study of the existing pavements made during the past 5 of 6 months, which involved hundreds of test holes through the pavement to examine the character of the pavement, base, subbase, and the subgrade soils. Several hundred tests, both in the field and laboratory, were made on the significant materials, and the results of these extensive studies were previously submitted in numerous technical reports to the district engineer, east Atlantic district. Subsequently, during July and August, available data was analyzed and reviewed at numerous conferences held in Morocco, which were attended by highly qualified engineers and consultants, representing the Air Force, the Office of the Chief of Engineers, the division engineer of the Mediterranean division, and the east Atlantic district of the Corps of Engineers.

As a result of these technical studies, recommendations were made by the architect-engineer. These recommendations were reviewed at a conference held by the Chief of Engineers in Casablanca on August 15 at which were present the division engineer, the district engineer, and representatives of the architect-engineer.

The following program which was recommended by the architect-engineer as the most practical method of strengthening pavements for heavy aircraft use was concurred in at this meeting—

PUSOM'S REPORT ON STUDIES AND RECOMMENDATION FOR REMEDIAL ACTION

And, Mr. Chairman, at this point I should like to submit for the record a copy of the architect-engineer's report on these studies and his recommendation as to the plan for remedial action, to be inserted in the record at this time.

This report is signed by Mr. Porter of the architect-engineer firm of PUSOM, and he is present today.

Mr. RILEY. What is the date of that report, General?

General PICK. This carrying letter here is dated September 11, sir.

Mr. RILEY. 1952?

General PICK. 1952.

Mr. RILEY. Without objection, a copy of this report will be inserted in the record.

(The document is as follows:)

PORTER, URQUHART, SKIDMORE, OWINGS & MERRILL,
September 11, 1952.

Subject: Moroccan Air Bases, Sidi Slimane and Nouasseur.

Lt. Gen. L. A. PICK,
Chief of Engineers, United States Army,
Washington, D. C.

DEAR GENERAL PICK: In response to your recent request, there is submitted herewith a brief summary report which includes conclusions, recommendations, and estimates for repairing, strengthening, and resurfacing of aircraft pavement areas on the Sidi Slimane and Nouasseur Air Bases. This report is based on the detailed evaluation study of the existing pavements made during the past 5 or 6 months, which involved hundreds of test holes through the pavement to examine the character of the pavement, base, subbase, and the subgrade soils. Several hundred tests, both in the field and laboratory, were made on the significant materials, and the results of these extensive studies were previously

submitted in numerous technical reports to the district engineer, east Atlantic district. Subsequently, during July and August, available data was analyzed and reviewed at numerous conference held in Morocco, which were attended by highly qualified engineers and consultants, represening the Air Force, the Office of the Chief of Engineers, the division engineer of the Mediterranean division, and the east Atlantic district of the Corps of Engineers.

As a result of these technical studies, recommendations were made by the architect-engineer. These recommendations were reviewed at a conference held by the Chief of Engineers in Casablanca on August 15 at which were present the division engineer, the district engineer, and representatives of the architect-engineer.

The following program which was recommended by the architect-engineer as the most practical method of strengthening pavements for heavy aircraft use was concurred in at this meeting:

(*a*) *Nouasseur.*—1. Roll and repair any weak areas encountred on the operations apron next year after the subgrade has dried to the proper moisture content to obtain consolidation and strengthening. Place an asphaltic leveling course which will probably vary from 0 to 2 inches in thickness or an average of approximately 1 inch over the entire area. Place the 2 inches wearing course pavement which has not previously been placed and therefore is not included as an item in the repair cost.

2. Roll the existing pavement on the north refueling apron and the north warm-up apron and then place a 1-inch dense graded wearing course to furnish maximum protection against the spillage and blast of jet aircraft. This work should be completed this year.

3. Roll the runway, taxiway, and parking apron during warm weather this year and then apply a seal coat to furnish maximum protection against moisture infiltration. The evaluation tests indicate that the existing strength of the subgrade and base are sufficient to support the design loads. Rolling with the 200-ton roller should further strengthen the pavement and its foundation in addition to pretesting every square yard of surfacing with very heavy wheel loads exceeding that of any known aircraft. It is intended that the pavements should be kept well sealed to prevent infiltration of moisture.

(*b*) *Sidi Slimane.*—Roll and consolidate the upper base with an adequate number of passes of the 200-ton roller. It is expected that this rolling will show up any weak areas which exist at the present time. Repairs should be made in all weak areas detected by rolling, in addition to those found by the evaluation tests on 3,300 feet of the taxiway and at other locations on the runway and aprons. After removing and reconstructing any weak areas in the base, place a 1½ to 2 inch thickness of surfacing of dense grade asphaltic concrete pavement. Reevaluation studies will be necessary during the rolling and repairing the pavements to determine whether or not the 1½ to 2 inches of resurfacing is adequate.

(*c*) The above procedures are recommended by the architect-engineer as the most reasonable engineering solution for the strengthening of the existing pavements at these two air bases to approximate design requirements at minimum cost. It further appears from the evaluation studies that this rolling and strengthening may prove adequate, based on the present known strength and character of the materials. If any appreciable weakening of the subgrade or base course occurs under operations in future years, the logical solution would be to add an additional thin increment of surfacing to restore the pavements in accordance with standard methods for repairing and strengthening of highway and airfield pavements in this country. These recommendations and the attached estimates are based on the best information now available and as previously stated, are believed to be a reasonable solution to the present problem, even though there is a possibility that experience and further tests and reevaluation studies after rolling, may indicate that a greater thickness of pavement of the order of 1 to 2 inches in some areas may ultimately be required to give adequate service without excessive maintenance.

The above recommendations for repairs and resurfacing apply to the pavements which were constructed during the rush program in 1951. The new pavements constructed since February 1952 have all been closely controlled to produce a superior pavement fully conforming with the design criteria for these air bases.

The proposed resurfacing will, with the existing asphaltic binder and surface courses, provide 4 to 6 inches of bituminous base and pavement on the various aircraft areas at Nouasseur and approximately 6½ inches of bituminous pavement at Sidi Slimane. Even if it becomes necessary at some future date to add 1 or 2 inches of additional bituminous surface course to strengthen and level up the pavement, the over-all total thickness would still be appreciably less than that used on many airfields and roads in this country. As examples, the bituminous base course and pavement on the Newark runway now being constructed is 8½ inches in thickness; the asphaltic base and surface on the new Friendship International Airport in Baltimore is 10 inches in thickness; the penetration macadam and asphaltic pavement on the New Jersey Turnpike, which was designed for low maintenance during a 35-year life is 12 inches in thickness; the concrete pavement on the runways at Idlewild International Airport is 12 inches in thickness.

Sincerely yours,

PORTER, URQUHART, SKIDMORE, OWINGS & MERRILL,
By: O. J. PORTER,
Deputy Contract Director.

Estimate of repairs and resurfacing

NOUASSEUR

Item	Quantity	Out-of-pocket unit cost	Total out-of-pocket cost
Roll 6 coverages [1] ..... square yards	268,000	$0.007	$1,876
Remove unstable subgrade and base ..... do	27,000	.50	13,500
Replace subgrade ..... do	27,000	.50	13,500
12 inches of new base to replace poor base and subgrade in small weak areas ..... tons	15,300	3.20	48,960
Subgrade pipe drains with drop inlets to correct drainage	LS	LS	60,000
1 inch of binder course pavement (average for leveling) ..... tons	15,000	9.40	141,000
2 inches wearing course not previously placed and therefore not included in repair cost ..... tons	30,000		
Total			278,836
North warm-up apron and north refueling apron:			
North warm-up apron ..... square yards	29,300		
North refueling apron ..... do	70,400		
Total area ..... do	99,700		
Rolling ..... do	100,000	.007	700
1 inch asphalt surface ..... tons	5,650	9.40	53,110
Total			53,810
Parking apron, taxiway, and runway:			
Parking apron ..... square yards	127,800		
Taxiways ..... do	140,000		
Runways ..... do	245,000		
Total area ..... do	512,800		
Rolling ..... do	512,800	.007	3,590
Patch-weak areas, taxiway station 7/65 ..... do	3,000	5.00	15,000
Seal ..... do	512,800	.146	74,867
Total			93,457
Net total out-of-pocket cost			426,103

[1] Operations apron, 268,000 square yards.

Estimate of repairs and resurfacing aircraft pavements Sidi Slimane

Basis: strengthening to approximate design requirements.

1951 construction areas	Additional wearing course	Square yards
	Inches	
Maintenance apron	1½	113,000
Parking apron	1½	194,000
Operations apron	1½	75,000
East refueling apron	1½	83,000
West refueling apron	1½	67,000
West warm-up	2	30,000
Runway	2	245,000
Cross taxiways	2	52,000
Main taxiway (best portion)	2	67,000
Area requiring 5 to 8 percent base repairs		926,000
Area requiring base repairs (say 8 percent) 2-inch binder course [1]		74,080
Main taxiway (weak portion) 2-inch binder course [1]		25,000
Base repairs total		99,080

[1] 2-inch surface course pavement included above.

	Quantity	Out-of-pocket unit cost	Total out-of-pocket cost
Rolling square yards	1,025,000	$0.007	$7,175
Remove pavement and extra base course tons	42,450	.55	23,347
New base course tons	28,800	2.00	57,600
Asphaltic concrete tons	88,550	7.30	646,415
1 inch additional pavement on 9,000 feet of runway which was omitted in initial construction	11,000		
Total			734,537

General PICK. Mr. Chairman, there is this one further statement I should like to make. I believe that everyone interested in the development of and the carrying out of this testing program has been fully informed of what is taking place, and I believe all of the interested parties—the architect-engineer, the district engineer, the division engineer, and the construction contractors, the Atlas organization—concur in the findings of this report.

General HARDIN. Mr. Chairman, the report which General Pick has just presented includes, as you will note, certain enclosures on the detailed cost breakdown of the remedial work. You will notice that the costs are marked "out-of-pocket costs."

BASIS OF COST ESTIMATES FOR REMEDIAL WORK AT NOUASSEUR AND SIDI SLIMANE

I should like to invite the attention of the committee to what is meant by "out-of-pocket costs" and why we use this approach in presenting the cost estimates. As we see the problem, what is desired is the actual additional outlay required to improve the pavements to full operational standards.

Out-of-pocket expense will include direct labor, direct material cost, direct supervision charges, and the plant maintenance expense of the plant while operating on this work. It will not include general overhead and the amortization of plant charges, because we feel that it would be improper to add to the additional outlays these charges

on amortization and general overhead, for this reason: the amount of overhead and plant amortization for this project as a whole is not increased by this additional work. If we apply increments of this overhead and the amortization charges to the work in question, it would merely mean reducing predetermined charges of these indirect costs applicable to other features of the work, but the total would not be changed.

It would be a laborious process and costly to revise and reconstruct past records to merely charge off overhead to this particular remedial work. Such costs as main office expense and warehouse construction and maintenance work are not involved by this remedial work. Those things have already been arranged for for the project as a whole, and we do not feel that it is appropriate, in evaluating what the additional outlay will be, to redistribute these indirect charges to these features now considered necessary to improve the aircraft utilization areas.

In summary, out-of-pocket expense means the additional expenditures of materials and effort occasioned by the need to improve the aircraft ultilization area, and the overhead, the physical plant, administrative costs, resulting in having to engage people, are not increased thereby.

Now, another aspect of this remedial work, as we see it, is that the amount of funds provided for the construction of these aircraft utilization areas will be sufficient to do this work without seeking additional funds from the Congress or from the Air Force. I would like to point out that even with the remedial work which is estimated to be placed at Sidi Slimane, we will still be well within the line item amount set up for construction of such areas at that project.

At Nouasseur the picture is slightly different, in that according to the cost records as they exist today, the cost of the pavement at Nouasseur has exceeded slightly the line item amount, or will exceed slightly, because some of it is still to be done. However, the amount of remedial work which we anticipate will be necessary at Nouasseur is of such magnitude that the line item amount set up for these areas will not be exceeded by an amount more than what is the rule of operation of 20 percent, where exceeding the line item by that amount is subject to approval by the local Air Force installation representative. I mention this because I feel that in talking about costs we must know and understand what the terms are that we are using.

ACCURACY OF ESTIMATES OF COST FOR REMEDIAL WORK

Mr. RILEY. General Hardin, would you consider this estimate on the corrections in the construction a minimum estimate, a maximum estimate, or a realistic estimate?

General HARDIN. I would say that at the time the estimate was made it was a minimum estimate, but still within the bounds of not being underestimated, and we pointed out that we would not know fully, particularly at Sidi Slimane, whether there would be more or less work required than we had estimated. We do not believe it will be less than we have estimated. We think that the amount we included for Sidi Slimane is a reasonable minimum for that field. It may be increased by reason of some additional evaluation tests that we still have to make after compaction is completed.

Mr. RILEY. If this is a minimum estimate, would you hazard an opinion as to what the maximum might be?

General HARDIN. I think that the figure which we have at Nouasseur will stand without any question. At Sidi Slimane, I would like to defer to Mr. Porter on that subject, because of the intimate knowledge that he has of the evaluations that have been made, and the current estimate used for the improvement was prepared after a great deal of research on his part.

Mr. DONNELLY. You want Mr. Porter to give us the benefit of his views at this time?

General HARDIN. Yes.

QUALITY OF BASE MATERIAL AT NOUASSEUR AND SIDI SLIMANE

Mr. RILEY. Let me ask one further question. General Hardin, was the material used at Nouasseur considered of lesser construction value than that used as Sidi Slimane, or was the material used as Sidi Slimane considered of lesser construction value?

General HARDIN. Mr. Chairman, if I understand your question correctly——

Mr. RILEY. I mean as regards the rock base.

General HARDIN. The rock base at Nouasseur is the superior material, in comparing it with the material at Sidi Slimane. I would like to ask our expert on that for his concurrence or not.

Mr. PHILIPPE. That is quite true, because the materials are of an entirely different source at Nouasseur than at Sidi Slimane. At Sidi Slimane the material is crushed sandstone and gravel, and you would expect the rock material at Nouasseur to be the better of the two.

Mr. DONNELLY. Mr. Porter, would you comment on General Hardin's suggestion that you can help us on the estimate at Sidi Slimane?

Mr. PORTER. Yes, sir. First, if I may, I would like to touch on one or two points to explain my answer. I concur with Mr. Philippe's statement that the crushed rock at Nouasseur is better material than the gravel used at Sidi Slimane. The other point, before coming to the question which is of most importance to you, is that the pit-run gravel material such as used at Sidi Slimane, without the complete processing, screening, and so forth, to give it stability, obviously is not susceptible to an exact analysis, because each load may vary within certain limits. Part of the trouble at Sidi Slimane is due to the fact there were clay pockets within this pit. Our study indicates that this was very troublesome on 1951 work. The areas that have inferior material in them vary. Some of those areas are only the size of a normal table, and you move over and have good material. Because of this varietion it is very difficult to accurately estimate conditions. Even if you put in between 150 and 200 test holes in the area, that still represents a small percentage of the million-plus square yards involved.

To see how extensive we have gone into it in an attempt to arrive at an approximate figure for the weak areas, there were some 3,200 tests performed on this area since February. Over half of those tests were made in place in the field to determine the sheer strength of the existing base at the existing moisture content, which, as a general rule, is good and adequate to support loads, and it has already proven adequate to support loads of 200 tons, which is much greater than the concentrations of loaded aircraft.

We have estimated that there will be 5 to 8 percent of bad spots that will have to be dug out. The higher figure was used in the cost estimate. Our limited experience to date gives us reason to believe that it may be appreciably less than that.

The other possibility, however, is that there will be larger areas actually found when repair holes are opened up and the poor base removed. We may have to take in a larger area. Where weakness shows on the surface of a 10-by-20-foot area, we might have to open an area double that size to remove all the defective base.

The other factor is, the base generally, including 92 percent or more of the samples, shows reasonable freedom from clay, and they should consolidate to give stability. They must be consolidated, however, when moisture content is somewhat higher than now, because they are so strong in their present dry condition that they hold up the 200-ton roller.

Coming back to your point, if the rolling program does not bring the material up to the stability anticipated in this estimate—which was the best estimate that could be made with the joint efforts of Dr. Buchanan, Mr. Philippe, Mr. Pringle, and members of our staff—it might be necessary to place 1 or 2 inches more of pavement in certain areas, and that would increase the out-of-pocket cost; it would double the item you have in this estimate of $646,000 for additional pavement. That is taking a pessimistic view. You instructed me, I think, to answer the question in that light.

Mr. RILEY. That would be the maximum out-of-pocket cost, in your opinion?

Mr. PORTER. Yes. The cost at Sidi Slimane may be somewhere between three-quarters of a million and possibly a million, but if you look at it with very dark glasses you could bring it up another quarter of a million or $300,000 more.

Mr. RILEY. Is that foundation at Sidi Slimane pit-run gravel?

Mr. PORTER. A great deal of the work we did last year in the rush program was pit-run material. A portion of it in the upper part had been run through a crusher to crush down the oversized particles above 2 or 2½ inches in size.

Mr. RILEY. Am I correct that sometimes you have the problem of crawling in your use of gravel?

Mr. PORTER. Not if the gravel is well graded. Under a 6½-inch pavement such as is proposed in this report, the gravel would be firm when compacted sufficiently. The problem we have is to compact it to the high degree necessary to obtain stability when it is soaked. I used the word "soaked" instead of "saturated."

Mr. RILEY. You think the compaction would be sufficient to prevent crawling under heavy usage after this rolling process?

Mr. PORTER. Yes.

Mr. PHILIPPE. I would like to add, and the addition of pavement as recommended in Mr. Porter's report.

Mr. PORTER. I meant to add that to my statement. That is the additional resurfacing now proposed to bring it up to the 6½ inches.

OPINION OF PUSOM ON TESTS AND CORRECTIVE ACTION NECESSARY

Mr. DONNELLY. Mr. Porter, do you concur in the statement of General Pick with reference to the nature and scope of the tests, the

evaluation of the tests, and the extent and type of the corrective action necessary?

Mr. PORTER. Yes. I have a tabulation of all the tests. There were some six or seven thousand tests made on the two air bases. My last remarks had to do with the fact that even if you test frequently this Sidi Slimane runway, you still can't be assured that the tests made in one place will be the same as one made 40 feet away. You have to do it on the basis of average results, and assume that that will be your over-all average in the end. Because of that, you must make a large number of tests.

Mr. DONNELLY. Do you want to make any amplifying statement on your letter of September 11 to General Pick, with the enclosures, or will that letter stand on its own feet?

Mr. PORTER. I might add one word regarding the out-of-pocket cost. Those unit prices as used in the estimate were obtained from the district engineer and the contractor in a conference, and were backed up by the current cost records of the contractor. I see no reason, if those records are as good as I understand they are now, why the unit cost should vary widely in out-of-pocket cost.

QUALITY OF BASE-COURSE MATERIAL

Mr. DONNELLY. Mr. Porter, the testimony in the record which this committee has taken heretofore indicates that the gravel pit from which the base-course material was taken for the Sidi Slimane construction had some clay content intermingled with the gravel in it; is that correct?

Mr. PORTER. Yes.

Mr. DONNELLY. Was there some better pit or quarry at some distance from Sidi Slimane?

Mr. PORTER. Yes. The initial study for Sidi Slimane Air Base—which I think you realize was not put in the program until after we were over there prepared to start work—the preliminary study covered a radius of 25 miles from the air base, and an examination was made of quarry sites that had been used previously or were being used at that time.

The nearest quarry site is some 11 or 12 miles upstream from the gravel pit, on a small river, on a very narrow road, and it was not selected because of the time element, No. 1; and No. 2, because of the added cost of building a road and hauling crushed rock out over that additional 11 or 12 miles to get it over to the air base.

The present pit is about 6 miles from the air base, so it would make the total haul of the order of 17 or 18 miles.

The other pit we studied was located to the east, and that would involve a rail haul and extra cost, and the plants that were operating there were of a very amusing type. They brag about turning out 200 cubic yards per day. Furthermore, there were not cars on the railroad sufficient to bring the quantity in to meet the schedule set by the district engineer.

Mr. DONNELLY. There has been much said in this record and elsewhere as to deviation from specifications. In the determination made to use pit run gravel, unscreened, from the gravel pit at Sidi Slimane for the base course, would that amount to a general specification?

Mr. PORTER. I think I should first state that the specifications did not call for pit run material as initially proposed and as approved by the district engineer. It did anticipate the use of pit run gravel over the sand for a lower subbase course and then crushed gravel in the upper 6 inches of the base. Lack of construction capacity, and lack of adequate crushing equipment, resulted, I understand, in much of the base, the upper base, going in pit run. There might be 10 or 15 percent crushed particles.

Mr. DONNELLY. It was unscreened; was it not?

Mr. PORTER. Yes.

Mr. DONNELLY. When the decision was made to put that material in which you have just described, will you, as the architect-engineer, regard that as the general specification as to the type of material to go in the base course?

Mr. PORTER. Normally, as in this case, you specified it should meet a certain gradation, certain requirements, then it is up to the plant producer to take out excess fines. It is the general specification in many States to use a pit run material meeting certain grading requirements.

Mr. DONNELLY. Out of the gravel pit at Sidi Slimane there was taken from time to time gravel which had an excessively high content of clay in it, as we understand the record. Is that right?

Mr. PORTER. Yes, sir.

Mr. DONNELLY. In instances when that occurred, would you regard that as a failure of inspection, or would you regard that as a deviation from specifications, if the distinction is a clear one?

Mr. PORTER. Well, in all fairness, it might be some of both. We have numerous cases on record where the recommendations of inspectors were disregarded in the haste of the work, and as a result we have more of that clay material than would be the case if they proceeded on a normal basis. Some inspectors were on the night shift, and you must remember they are working around the clock, 70 or 80 hours a week, with the idea that the one important thing was to get the work done. It is very possible that our night inspectors did not issue instructions to reject every load that should have been rejected.

Mr. DONNELLY. With respect to the night operations, I take it the pit was lighted?

Mr. PORTER. Yes, sir.

Mr. DONNELLY. Who made the determination as to where the steam shovel was going to take the next bite? Was that made by a member of your organization in the pit?

Mr. PORTER. As a rule it was done by the superintendent of the contractor, and our inspector said, "It is poor there; move over."

Mr. DONNELLY. Were the decisions made at night as to whether the steam shovel would bite here or move over, more difficult because of the artificial lighting?

Mr. PORTER. In a pit 1,000 feet long, with four or five shovels running, I imagine it would be more difficult under artificial light than with a clear, visual picture of what they were taking out.

Mr. DONNELLY. Did you look into the instance when Harold Simmons, of your organization, tried to stop work at Sidi Slimane because unsatisfactory material had been laid in a portion of the runway or taxiway?

Mr. PORTER. Yes, sir.

Mr. DONNELLY. Do you know whether corrective action was taken in the sense of removing the unsatisfactory material and replacing it with suitable material?

Mr. PORTER. From my investigation and statements from various inspectors on the job, they didn't take out all of it.

Mr. DONNELLY. They did not take out all of the unsuitable material?

Mr. PORTER. No, sir.

Mr. DONNELLY. What was the position of the architect-engineer at this point? What did you do, and was the thing worked out to your satisfaction?

Mr. PORTER. I was not in Morocco at the time that incident happened. The district engineer's office and the area engineer in charge there, had the final say as to what should be taken out, and the contractor was under his direct supervision also. We did not have the authority to direct the contractor, as we sometimes do.

SUFFICIENCY OF INSPECTORS AT SIDI SLIMANE

Mr. DONNELLY. The chairman inquires if PUSOM had a sufficient amount of inspectors at Sidi Slimane?

Mr. PORTER. I don't hesitate to say that they were working long hours and were short-handed, and very, very short on equipment, both testing equipment and vehicles to get over the work.

Mr. RILEY. Do you operate 7 days a week there, Mr. Porter?

Mr. PORTER. Yes, sir; they were during the crash period.

Mr. RILEY. How long a shift did each man have? What were his working hours out of each 24?

Mr. PORTER. Ten or eleven hours was the usual rule for all our men, working on a two-shift basis, and getting up what records and tests they could after shift time. Many of our men, as the records will show, worked 70 or 80 hours a week as a regular thing in April, May, June, and July.

Mr. RILEY. That was during the so-called emergency program when you were getting those two air strips done; is that right?

Mr. PORTER. Yes.

Mr. DAVIS. I gathered from your letter to General Pick, Mr. Porter, that it was always intended that there should be 2 inches of wearing course pavement added at Nouasseur; is that correct?

Mr. PORTER. On the operational apron, yes, but it has never been completed; that is part of the initial construction.

Mr. DAVIS. With respect to Sidi Slimane, however, the 1½ to 2 inches that are recommended are in addition and by way of corrective measure to what was originally contemplated; is that correct?

Mr. PORTER. That is correct.

Mr. DAVIS. I will quote from your letter, paragraph C, page 2:

> The above procedures are recommended by the architect-engineer as the most reasonable engineering solution for the strengthening of the existing pavements at these two air bases to approximate design requirements at minimum cost.

That carries a clear inference that the previous work was not done in accordance with design; is that correct?

Mr. PORTER. Yes.

RESPONSIBILITY AND ACTIVITY OF PUSOM REPRESENTATIVES REGARDING USE OF IMPROPER AGGREGATE AT SIDI SLIMANE

Mr. DAVIS. Getting back to the specific incident that Mr. Donnelly mentioned earlier, your statement, I think, could be fairly interpreted to be that Mr. Simmons, your representative, was not satisfied with what was done after he called attention to the improper aggregate that was being used.

What was the responsibility of your representative in a case of that kind?

Mr. PORTER. To make a report to the district's area engineer and our office.

Mr. DAVIS. Assuming that Mr. Simmons did fulfill his responsibility in that respect, what happened after he did report to your office that unsatisfactory filling was being done?

Mr. PORTER. The records are very voluminous. There are records and letters in our files to show that we advised, and our inspectors advised, that inferior material was being placed in the work. I think there was undoubtedly some improvement made at times to stop that—more energetic supervision by the area engineer over the contractor. The fact remained that the work as completed to meet the deadline on July 14 still had some unsuitable material incorporated in the base. The amount of unsuitable material is considerably less on the work that was completed during August, September, and October on the aprons areas. The pit was controlled much closer and the uncrushed pit-run material was eliminated from the upper base after the July 14 date. Prior to that, with the shortage of material, they used pit-run material without running it through the crusher, particularly on the portion of the taxiway, which has shown cracking.

Mr. DAVIS. Let us get back to this specific incident again. As I understood your testimony in response to Mr. Donnelly's inquiry, there was at least one incident where one of your representatives said that the material being used was not satisfactory. He recommended that that material be removed, and as I understood your further comment, all of that material was not removed.

Mr. PORTER. That is right.

Mr. DAVIS. That was reported to you?

Mr. PORTER. That was reported in the records of the material that was put in place and in the soil reports made to the area engineer.

Mr. DAVIS. Is it correct to say, then, that the engineers undertook the responsibility to tell them to go ahead in spite of that report that was made?

Mr. PORTER. I think that describes quite clearly the procedure under which we were operating at that time.

Mr. DAVIS. That amounted, then, to an overruling by the engineers of the recommendations which you made; is that correct—the recommendations that your organization made?

Mr. PORTER. I think that is true in numerous instances.

ESTIMATE OF COST OF REMEDIAL WORK AT SIDI SLIMANE AND NOUASSEUR

Mr. DAVIS. It was not clear to me in your responses to Mr. Donnelly as to that dark picture, as you called it, of $1,500,000 to $1,750,000.

Was that figure that you quoted for the rectification of the work at both Nouasseur and Sidi Slimane, or was that only for Sidi Slimane?

Mr. PORTER. We were speaking of Sidi Slimane, and the increased figure I gave you was the last figure on the breakdown of the estimates. You have it there. The estimate is included in my report.

Mr. DAVIS. I have a tabulation dated August 9, 1952, which was attached to your letter, General Pick, dated September 11, 1952.

Mr. PORTER. The statement that I made on Sidi Slimane, looking at it with dark glasses, was that the amount of asphaltic pavement might range 1 to 2 inches thicker than recommended in this report. As covered in this report the out-of-pocket cost is shown of $646,415 for 88,550 tons of asphalt. That is for 1½ to 2 inches that we are proposing now, so, if you step that up, or double that figure and add it to this total, you would have the figure that I gave you previously.

Mr. DAVIS. Without that assumption, the figures which you gave coincide almost exactly with the figures which the Corps of Engineers has given; is that correct?

Mr. PORTER. Yes. I think that they stated they used our figures.

General PICK. Mr. Chairman, I think they are exactly the same figures.

Mr. RILEY. Yes.

General PICK. Because they are Mr. Porter's figures.

Mr. DAVIS. Mr. Bonny, have you had an opportunity to go over the estimates as to the volume of work and the unit costs for this rectification work that we have been discussing here this morning?

Mr. BONNY. I have not personally gone over them. Mr. Mills and Mr. McClary have been over there within the last few days, and I know that with Mr. Wilbur has concurred in the figures that you have given this morning. I have seen a detail of them. We concur in the statements made.

Mr. DAVIS. Have you, Mr. Maxon, had occasion to study these estimates, or consult with anyone about them?

Mr. MAXON. As now prepared?

Mr. DAVIS. As now prepared.

Mr. MAXON. No, sir; I have not seen them.

Mr. DAVIS. To the best of your knowledge, General Pick, have representatives of the Air Force made any study of these figures and made any statements concerning them?

General PICK. I understood that the Air Force liaison officers were in on the meetings where these were discussed, sir. I believe that General Walsh could give first-hand testimony as to that.

General WALSH. Colonel Barnett, the Air Force installation representative, has seen the estimated costs, and I have heard no comment from him that indicated that he took exception to any part.

Mr. HUGGINS. May I speak to that, Mr. Davis?

It is not usual for the Air Force to speak specifically to costs; we do not have the background and the capability of doing that. Normally we take the costs as prepared by the Corps of Engineers. I went over General Pick's report with Dr. Buchanan, who is the special soil and pavement consultant for the Air Force. He is a professor at Texas A. & M., and has had extensive experience on airfield work during the war. He described the figure of $1,116,000 in somewhat different terms, but to the same effect as General Hardin did: That it was a

minimum figure. He described it as being based upon the most hopeful condition which could prevail.

All of our reports from Morocco since the middle of August, since the rolling program began, indicate that the hopeful conditions do not exist at Sidi Slimane. Insofar as concurrence in the figures are concerned for Sidi Slimane, we feel that the costs are likely to be very substantially larger. If Mr. Porter's figures are looking at it with dark glases, we are probably in complete darkness, but since we have to put up the money that is the picture. Insofar as Nouasseur is concerned, I do not think we have any reason to doubt those. It looks as though the rolling program there is all right; but I think we must say, insofar as the apron is concerned, how that will turn out depends upon the future, and we feel that it is pretty much of a guess.

Mr. DAVIS. Your present best estimate then would be that even Mr. Porter's estimate with respect to Sidi Slimane of $1,500,000 to $1,750,000 is perhaps too optimistic; is that correct?

Mr. HUGGINS. Very much so. The rolling on the taxiway was stopped by General Old—not on the taxiway, but the runway. It showed a good deal of waviness. He stopped the rolling so there would still be an operational runway. I think there was a further delay in rolling with the expectation that it would be continued after the rains in the hope that future dampness in the subbase would contribute to better compaction. The rolling had not produced the compaction desired. I talked that over with Dr. Buchanan, and he said if the rolling would produce better compaction it would indicate clay in the subbase and a fault rather than a beneficial result.

Our only feeling on it is that it is likely to cost several million dollars at Sidi Slimane and not $700,000-odd or double $700,000-odd. In other words, from what we know to date on the basis of the rolling tests, there are major faults in the base course, and the addition of a cover coat of asphalt 2 inches or 4 inches may not be the answer. Again, we do not know what the answer ought to be, but we are considerably worried about it.

AREA OF SIDI SLIMANE RUNWAY ROLLED AT TIME OF MAXON SURVEY

Mr. DAVIS. Now, Mr. Maxon, you told us yesterday, I believe, when you visited there, that about one-third of the runway had been rolled with the 200-ton roller.

Mr. MAXON. No, sir; 100-ton roller. They rolled only a small portion of it.

Mr. DAVIS. The one-third that was mentioned, did it coincide roughly with the 4,000 feet that the Secretary has mentioned?

Mr. MAXON. I will refer to Mr. Rowe.

Mr. ROWE. Mr. Chairman, at the time we were at Sidi Slimane, the only rolling that had occurred on the runway was about 400 feet, which we were told had been done with a 100-ton roller.

Mr. DAVIS. It was 400 feet at that time?

Mr. ROWE. 400 feet, not 4,000 feet, and it was done with a 100-ton roller and not a 200-ton roller.

Mr. HUGGINS. There was a 200-ton rolling of 4,000 feet, leaving 7,000 feet operational. That is the figure that I am talking about.

Mr. ROWE. We did not see any of the operation of the 200-ton roller on any part of the Sidi Slimane base.

Mr. DAVIS. We must assume then that the rolling that you are talking about, Mr. Secretary, was done after the visit of the Maxon people.

Mr. HUGGINS. I believe so. It was done the latter part of August.

Mr. MAXON. That was an over-all plan. What we saw was an initial process, the result of an initial process.

STOPPAGE OF ROLLING ON SIDI SLIMANE BASE

Mr. DAVIS. Were you aware, General Pick, that General Old had stopped the rolling at this runway?

General PICK. No, sir; I have no information that he has stopped the rolling. I would like to ask Assistant Secretary Huggins where he got that information.

Mr. HUGGINS. I got it from General Old.

General PICK. When did it happen, sir?

Mr. HUGGINS. In the latter part of August—I guess about the 24th or 25th.

Mr. DAVIS. Was that in a written communication to you, Mr. Huggins?

Mr. HUGGINS. Yes.

Mr. DAVIS. Might we have a copy of that communication for the record at this point, or is it of a classified nature?

Mr. HUGGINS. I would prefer not to, if that is all right. I would be glad to let you read it, but I would rather not have it in the record.

Mr. DAVIS. Would it be possible to give us a paraphrase, or some substantive evidence for the record on that, and then permit us to see the original so we may judge the accuracy of the paraphrase?

Mr. HUGGINS. Yes. I am trying now to find the exact communication that states that he asked Colonel Campbell—here it is, a letter to me dated August 26th. He states that he visited Sidi Slimane 2 or 3 days before while they were testing the west 4,000 feet of the runway. Quite a number of soft spots have developed in the rolling, and at each place where the runway had been cut for ducts the pavement had settled down several inches. In addition, the pavement was developing a very wavy surface, which would place a severe strain on heavy aircraft landing or taking off on that portion of the runway. The district engineer advised that if the rolling were to raise the CBR, the base course to a minimum of 55, 2 additional inches of asphaltic concrete would be added to bring the load-carrying capacity up to design specifications and provide a smooth surface. Only a few reports on CBR's have ben received, and these average between 30 and 40. General Old feels that an additional 2 inches would not bring up the specifications; that 4 inches would be costly, and, from the way it looks now, 2 additional inches of asphaltic concrete would not do the job. The district engineer stated that he would be in a position to give an analysis later, but General Old was pessimistic. I will quote this sentence:

I requested Campbell not to conduct any further tests on the runway itself after they complete the repair work on the west 4,000 feet, otherwise it is extremely doubtful we could keep the field operational due to a rough, wavy surface.

Subsequent tests will be conducted upon the taxiways and aprons.

Mr. DAVIS. When did you leave from north Africa, General Walsh?

General WALSH. On the morning of September 11.

Mr. DAVIS. Colonel Campbell at no time had advised you of this request by General Old at Sidi Slimane?

General WALSH. Not any request from General Old. He stated that in view of some information that General Old had given him, that Mr. Huggins had advised we could not put on a leveling course in the area that had been rolled, that he (Campbell) had decided not to continue rolling any part of the runway other than that 4,000 feet until the question of funding for the leveling and strengthening coats was cleared up, and he had moved the roller to the maintenance area. I asked him specifically whether or not he intended to continue rolling there on the afternoon of the 10th, and he told me that he did.

Mr. HUGGINS. I might clear up a point, Mr. Davis.

DISCUSSION OF ACCURACY OF ESTIMATES FOR REMEDIAL WORK AT SIDI SLIMANE

Last spring when we reprogramed the Moroccan bases and came before this and other committees on the reprograming, we went before Senator Lyndon Johnson's subcommittee that handled that phase of it for the Armed Services Committee of the Senate. That reprograming involved the justification for an estimated expenditure of a total of $420,000,000 on the Moroccan Base complex. We were asking for the application of money already voted to us on the refunding on the reprogramed program.

Senator Johnson asked specifically if any of that money was intended to do repair work to make up for deficiencies, and he was advised that it was not intended for that purpose, that there was no repair money in the $420,000,000 program. He then stated that he would approve the reprograming on the basis that the funds would not be used for major repair work without coming back to him with a statement as to what it was anticipated it would be used for. We have gone ahead with his knowledge in minor work, repair work like patchwork or dental work, as it is called, to keep the pavements in a satisfactory condition for operation.

When this program came in I was in receipt of a cablegram from General Old referring to the estimated cost of seven-hundred-thousand-odd dollars at Sidi Slimane and four-hundred-thousand-odd dollars at Nouasseur, asking that we obtain approval from Senator Lyndon Johnson for that major repair work. I then asked Professor Buchanan to come in and go over the situation with me. He came in. By the time he came in we began to get cables on the rolling program because we did not have an evaluation on the basis of the present facts as known to us. We have not gone for a release of funds to Senator Johnson's committee for major repairs. We do not consider the $1,200,000 sufficiently firm in the light of the results of the rolling program to permit us to do that.

General PICK. Mr. Chairman, I would like to point out that the information which the Secretary has just read into the record as to the investigations and the test program were the data collected by the architect-engineer, who is present here now, and it is information that was used in making up the program, the remedial program, which has

been included in my report. It seems to me that that same test data has been tested and analyzed and evaluated by our experts, and I believe those are the same data referred to in the letter that Mr. Huggins had from General Old.

Mr. HUGGINS. That is not correct. I will agree with you that the test data on the basis of which your $1,160,000 figure was based are test data that have been reviewed by Dr. Buchanan, Mr. Philippe, and Mr. Pringle. I think Mr. Pringle will confirm that. As General Hardin indicated, that was the minimum that it was expected to cost. I think that was also Dr. Buchanan's statement. It was the rock-bottom minimum if all conditions were the best that could be hoped for.

The information here on the basis of which we do not feel that the $1,200,000 or the $1,160,000 is the proper figure is the result of the 200-ton compaction-rolling program which was started as a result of the meetings in Morocco after your experts and ours had left. As a matter of fact, when Dr. Buchanan got that information we asked him to return to Morocco, but he could not do so because of the start of college.

General PICK. Mr. Chairman, the 200-ton roller was on the base when I was there at Sidi Slimane, and I believe that it had been rolled. Is that true, General Walsh?

General WALSH. That is correct; yes.

What is the date of that letter, sir?

Mr. HUGGINS. August 26, 1952.

General PICK. Mr. Porter, how many additional experiments did you conduct there between the 20th and the 26th?

Mr. PORTER. I can answer that only partially. The rolling program was nearing completion on the 4,000 feet of the runway when I left Morocco approximately on the 20th of September. The first 2,500 feet had been completely rolled with six coverages. The next 1,500 feet of runway, making a total of 4,000 feet, had been rolled with three coverages with a 200-ton roller.

General PICK. What were the results of those rollings? What did they indicate?

Mr. PORTER. They indicated a lesser amount of weak base than we had anticipated. There were some small areas I mentioned before, that had settled down one-half of an inch to an inch. Otherwise, the runway was consolidating from measurements taken about one-quarter of an inch generally. It is true that the duct lines were all showing settlement. Those are very narrow strips.

General PICK. Explain what a duct line is.

Mr. PORTER. A duct line is a strip across the runway.

General PICK. How wide?

Mr. PORTER. About 2 feet wide across the runway. A trench is excavated in order to put in the conduit pipes for the electrical and lighting facilities. Those are always troublesome. In backfilling them you have only equipment available such as hand tampers until you can put a heavy roller on them. It is recommended that they immediately cross-roll those duct lines, which is a relatively small strip, and to put a patching on to take care of the settlement.

General PICK. Do you concur in General Old's opinion as to the effect of the rolling on the 4,000 feet, as indicated in the letter just read by the Assistant Secretary?

Mr. PORTER. I concur that it was necessary to patch those duct lines immediately as they settled under the rolling program. Otherwise, there were only a limited number of slight settlements that would not be a hazard to aircraft.

Mr. HUGGINS. I assume that General Old's opinion was based on his job of being prepared to operate loaded bombers out of that base.

Mr. RILEY. The committee will recess now until 2 o'clock this afternoon, when we will go into this matter still further.

RECONDITIONING REQUIRED ON PAVEMENT AT SIDI SLIMANE

Mr. RILEY. The committee will please be in order. Mr. Porter, on the proposed reconditioning of the field at Sidi Slimane, is it your opinion that after compacting that runway you could put from 2 to 4 inches of bituminous asphalt on it, and would that take the waves out and keep the waves out with those heavy machines landing on it?

Mr. PORTER. The answer is, Yes, sir; that is the range in thickness which we consider necessary to strengthen the pavements to fully support the loads after rolling and compacting the base course and repairing the 5 to 8 percent of weak spots which we estimate are present in the base.

Mr. RILEY. Would that top surfacing, in your opinion, be sufficient to hold up over a reasonable period without the waves that were in the base reappearing in the top surface?

Mr. PORTER. Yes, sir; 98 percent of the waves that are now occurring are due primarily to consolidation of the base course under the rolling of the 200-ton roller; and when that consolidation has occurred and you level it up, that process does not go on to further compaction because there has been a precompacting with a load that I would say, offhand, is double that which it would be subjected to by the planes. There are weak spots, however, where there is excess clay which are subjected to plastic deformation and movement, and we propose and consider it essential to remove those weak areas that show a weaving action when it is under the heavy roller.

Mr. RILEY. You would have to cut those out and put your base back in and then do your top surfacing after all that repair work had been done?

Mr. PORTER. Yes, sir.

Mr. RILEY. These heavy machines that land there, do they create quite an impact, especially those jets that land at high speeds?

Mr. PORTER. They do on the landing gear, but experience has proven conclusively that the impact of landing on the pavement is not such a serious thing. It is like skating over thin ice. It goes so fast that the soil does not have time to move out from underneath the pavement.

Mr. HUGGINS. I might add that when a plane lands normally, if it is a good landing, it is still partially airborne, so that your greatest weight is not at the time of landing, but actually when the plane is standing still or taxiing.

Mr. PORTER. In addition to this theoretical approach to the problem, experience has shown conclusively that failures occur on runways at the take-off point and under warm-up conditions, on the warm-up aprons, rather than the central portion of the runway or the end where landings may be frequent.

Mr. RILEY. The requirement at these fields is that they withstand 100,000 pounds of wheel-bearing load; is that right?

Mr. PORTER. Yes, sir; on dual wheels.

Mr. RILEY. And when you run those 200-ton rollers over it, that represents twice that load?

Mr. PORTER. That is four times the amount. Each tire on that unit carries 100,000 pounds, whereas on the airplane you only have 50,000 pounds per tire. You also have the effect there of what might be considered the full weight of the plane acting on those four tires together, close together, whereas on a plane of 400,000 pounds, of which we do not have any at the present time, that weight is distributed over two sets of four wheels separated either longitudinally or transversely to the airplane.

Mr. HUGGINS. We normally figure the heavy pavements at 50,000-pound wheel load and 100,000 pounds gear load, the gear load being for two wheels, 50,000 pounds on each wheel.

Mr. RILEY. Do I understand, then, that the tests that you are putting them to represent four times the wheel-bearing load that would be placed on them, or twice?

Mr. PORTER. The gross load would be four times and the individual tire load would be two times.

Mr. RILEY. That was the point that I wanted straightened out. In your opinion, if this field is repaired, looking at it from the most unfavorable angle that you described this morning, at a cost incident to it, in the neighborhood of $2 million, would that be sending good money after bad, or would that make a usable field of reasonable lasting quality?

Mr. PORTER. It will give a usable field and furthermore, there is no other way to approach this problem. We have a condition there of weaknesses due to two causes; one, due to too much clay in the base, and the other due to lack of sufficient compaction. Without compaction it is not so good.

The conventional method on highway work and airport work, where your base is of a borderline character, is just to put on the additional thickness. In fact, the criteria of the Corps of Engineers if you were starting fresh on the problem, calls for using the most economical design and under their manual you still would use the crushed gravel base and a thicker surface rather than to haul crushed rock for many miles.

Mr. RILEY. What concerns me, Mr. Porter, is this. Sooner or later I am satisfied that the Air Force, or somebody, is going to have to come to us for this money to repair this air strip. We are either going to have to repair this or tear it up and build a new one. Is it an economical, safe and usable proposition to repair this air strip and would it last, in your opinion, a reasonable length of time?

Mr. PORTER. Yes, sir.

Mr. RILEY. You have no reservations about that?

Mr. PORTER. No. I think, furthermore, there is no other approach. We have an investment in a base course there. We have a good subgrade. We have a stable pavement of inadequate thickness over the base course. Standard design procedure therefore is, if it is economical, to put on more of the pavement. I cited in my letter, as an example, the thicker pavement at Baltimore International Airport. There you have an airport that would carry any plane now contem-

plated. They used 10 inches of bituminous base and surface, because it is the economical way to produce adequate strength over the natural sandy soils that were present. The alternative to that was to put on a concrete pavement, which is more expensive, or to extend the construction period for an extra year in order to import a crushed rock base from a long distance at a much higher cost.

ADEQUACY OF EQUIPMENT IN MOROCCO IN APRIL OF 1951

Mr. RILEY. Did you in April of 1951 have sufficient rock-crushing equipment there to operate both at Nouasseur and at Sidi Slimane, if you had elected to use crushed rock instead of gravel?

Mr. PORTER. I think that is out of the scope of my exact observation but, generally speaking, they did not have enough equipment to do the job in 60 to 80 days.

Mr. RILEY. Did you have any screening equipment at Sidi Slimane?

Mr. PORTER. No, they had no screening equipment either at Nouasseur or Sidi Slimane in their base rock plants during the so-called crash period.

Mr. RILEY. Do you recall seeing any rock-crushing equipment at Sidi Slimane at the time that you started the runway under discussion?

Mr. PORTER. Yes, sir. They had set up a two-stage plant, a primary crusher with a roll-type crusher. They also had portable plants for crushing the gravel down to the finer sizes passing a 1-inch opening for the asphaltic pavement.

Mr. RILEY. Could that equipment have been used in this rock quarry, which you testified this morning was about 12 miles from the operation?

Mr. PORTER. It could have been used there, but its capacity would not have been sufficient for the speed of placement required. In fact, the equipment was not sufficient to produce a crushed gravel base to meet the program and that I assume is why the district staff directed the use of pit run gravel on portions of the upper base, without the crushed gravel material conforming to the specifications.

Mr. RILEY. Would it be a fair statement then to say that the equipment was too light and of too limited capacity to do the job at the time that the engineers considered necessary for it to be done? Would that be a fair statement?

Mr. PORTER. Yes, sir. The crushing equipment they had there was working 20 hours a day, 7 days a week, and still could not keep up.

Mr. RILEY. I judge from that that it would have meant quite a long delay to have gotten equipment in there of sufficient capacity to use the crushed rock from the quarry?

Mr. PORTER. Yes, sir; certainly the work could not have been finished by July 14.

Mr. RILEY. Could you give us an estimate of about how much money it would have cost to haul the crushed rock 12 miles instead of hauling the gravel 6 miles? I believe those were the approximate distances?

Mr. PORTER. I think it was 6 miles to the gravel and 11 or 12 miles more to the rock, so it would have been about 17 miles, or 11 or 12 miles additional to the nearest quarry site.

Mr. RILEY. Then I misunderstood you. I understood this morning that it was 11 or 12 miles to the quarry.

Mr. PORTER. Farther; 11 or 12 miles farther.

Mr. RILEY. I am glad to get that cleared up, because I believe it was not clear.

In other words, it would be something like 17 or 18 miles over-all haul?

Mr. PORTER. Yes, sir.

Mr. RILEY. For the crushed rock?

Mr. PORTER. Yes, sir; plus building an expensive haul road.

Mr. RILEY. It is common practice to resurface roads and air strips that have gotten a washboard effect or a wave effect, with bituminous concrete; is it?

Mr. PORTER. Yes, sir. It is done every day on many of our roads that are worn out by heavy traffic. In fact, from my 25 years of experience I would say that the movements which we were very proud of prior to 1930, most of them have been covered since that time. By heavy traffic they have worn out and have had to be resurfaced.

Mr. RILEY. And that is the material that is usually used, what is known as bituminous concrete?

Mr. PORTER. Yes, sir.

Mr. RILEY. Thank you.

THICKNESSES OF PAVEMENTS AT NOUASSEUR AND SIDI SLIMANE

Mr. DONNELLY. Mr. Porter, do you see any significance in the fact that the asphaltic base and surface of the new Friendship International Airport in Baltimore is 10 inches in thickness, whereas the similar course at Nouasseur was 4 to 6 inches with the new layer, and at Sidi Slimane was 6½ inches with this new layer of asphalt?

Mr. PORTER. Yes; that just cites another engineering variable that we mentioned a moment or two ago. First, the subgrade or subbase is weaker than the average base material at Sidi Slimane and, therefore, required more bituminous pavement to carry the traffic. Next, I think that this statement may not agree with the general understanding in Washington of design requirements, but in my mind it is certain that our military construction is usually specified on a more or less minimum first-cost basis or the very least that you can get by with; whereas the Jersey Turnpike or the Baltimore Airport, which I cited is designed for 20 to 35 years of service with a low maintenance. Even so the maintenance estimate for, let us say, a highway or turnpike such as the New Jersey Highway included two resurfacings in its 35-year life. In other words, that to an engineer is something he would plan on and expect over a period of 35 years.

At Baltimore, by using a thicker asphaltic base and surface, you just insure lower maintenance and a longer time before resurfacing is required.

These comments about resurfacing of pavements, I believe, should not be taken just with regard to one type of pavement. I think, whether you use concrete pavement or asphalt, our experience clearly shows that over a period of 25 or 30 years of time most of them have to be resurfaced if they are subjected to heavy traffic.

FAILURE OF COMPLETE ASPHALTIC COURSES AT NOUASSEUR AND SIDI SLIMANE TO CONFORM TO ORIGINAL DESIGN SPECIFICATIONS

Mr. DONNELLY. As the architect-engineer, Mr. Porter, on Nouasseur and Sidi Slimane, in August 1952, this year, had the complete asphaltic courses to conform with your original design specifications been laid?

Mr. PORTER. No, sir.

Mr. DONNELLY. Well, in other words, when these elaborate tests were conducted and when the deficiencies showed up last year, had the construction job on the pavement, runways, taxiways, and aprons been completed?

Mr. PORTER. No, sir. In a number of areas they still required additional thickness to bring them up to the design thickness.

Mr. DONNELLY. In other words, the original design encompassed and embodied an additional 1 inch at Nouasseur plus a 2-inch wearing course over that; and at Sidi Slimane an additional 1 to 2 inches to complete the job as originally designed by yourself?

Mr. PORTER. That is part true and part not.

At Nouasseur on the operations apron the 1-inch additional there was shown in the estimate for repairs. That is an average for leveling off. But the 2 inches additional is the original pavement, which had never been placed on the operations apron at Nouasseur.

At Sidi Slimane we have the 4 inches contemplated by the original design on all areas except the central 9,000 feet of the runway. In the speed-up program the pavement was left thinner there. So the 1-inch additional proposed in that area is part of the original design thickness for which funds apparently are still available.

Mr. DONNELLY. Mr. Porter, in view of the apparent incompleteness of the pavement work at these bases when some of these tests were conducted with the 200-ton roller, for example, and other tests, did it come as any surprise to you that any deficiencies or defects should have cropped up?

Mr. PORTER. No. We expected fully and anticipated that up to 8 percent of the areas might have to be dug out and repaired. We fully expected that the rolling to be effective must compact and rut the runway to some minor degree. Otherwise it would not be compacting. This compaction is just settling the pavement down on most of the area where the base is not of a clayey nature.

On the 4,000 feet of the runway I thought the amount of the settling and the number of spots that showed to be soft was much less than our estimate; and I saw it when most of the rolling had been completed on the 4,000 feet.

Furthermore, we have taken 23 tests in that area since it was rolled, and there was only 1 sample out of the 23 tests that showed a moderately high clay content. That is less than the 5 percent, the low estimate I used, rather than approaching the 8 percent of the area which we had estimated might be weak.

Mr. DONNELLY. With respect to your estimate or PUSOM's estimate on the additional cost of the pavement at Nouasseur and Sidi Slimane, do you regard that as additional money to make repairs, or do you regard that as money to complete the original pavement work as designed by your organization?

Mr. PORTER. It is additional money to make repairs and for strengthening. The portion of the pavement that was part of the

original design is shown on that estimate, but not extended across in the cost. I think you will find a note there, "Two inches of surface, etc.," at Nouasseur with the tonnage, but not the cost in the extensions.

Mr. DONNELLY. That is correct, sir; 30,000 tons.

CIRCUMSTANCES OF 200-TON-ROLLER TEST AT NOUASSEUR

Now, with respect to the failures in some five places on the operations apron at Nouasseur, which occurred at a time when the apron was tested with the 200-ton roller, were you familiar with the intention to make that test before the test was made?

Mr. PORTER. Yes. I have been blamed for making it, and for causing a big commotion.

Mr. DONNELLY. Would you relate the circumstances of that test?

Mr. PORTER. Yes. We knew that there were weak spots in the apron area. Our theory was that we should go in and find out how many spots there were, and break through with this heavy load, which is four times the mass load and twice the wheel load, to break through the weak areas before spending the money for putting on the surface, and to dig those areas out, whether there were 5 or 15 or 20, and repair those areas. Then we have the assurance that a plane will not break through suddenly. Otherwise, if that had not been done, you have no assurance that you do not have a weak spot where even an expensive plane might sink in and cause damage to the plane.

Mr. DONNELLY. I take it, then, that the fact that there were break-throughs, in view of the purpose of your test, came as no surprise?

Mr. PORTER. No. We fully intended that. Even in this repair program we fully intend and hope that the 200-ton roller will show cracking and distortion in these local areas where there is a truckload or a number of truckloads of bad material, so that we will discover it now and cure the trouble before we complete the rolling and put on the surface.

Mr. DONNELLY. In other words, these are extreme tests?

Mr. PORTER. Yes.

EXTENT OF BREAK-THROUGHS AT NOUASSEUR

Mr. DONNELLY. I hand you the hearings printed to date, pages 171 and 172, and invite your attention to the sketch of Nouasseur at the top of the page. You will note on the operations apron there are five little circles indicating areas of break-through. Does that reflect the break-through picture as you remember it?

Mr. PORTER. It shows the approximate location of those break-throughs. Generally when they were dug out they were from 10 to 20 feet in size.

Mr. DONNELLY. Then proportionately the dimensions of those circles on that apron——

Mr. PORTER. Are far too big.

Mr. DONNELLY. They are too big?

Mr. PORTER. Yes.

Mr. DONNELLY. That would indicate then that the break-throughs there on that apron were much more limited than indicated here on the sketch?

Mr. PORTER. Yes.

ESTIMATE OF COST FOR REPAIR WORK AT SIDI SLIMANE

Mr. DONNELLY. Now, Mr. Porter, do you agree with Mr. Huggins that the cost of the additional work at Sidi Slimane, be it completion of the original design or repair work, or both, involves several million dollars?

Mr. PORTER. I do not see any evidence in the data we have at the present time to indicate that we should require any more than $1.4 million of out-of-pocket cost, which we spoke of this morning as viewed with dark glasses.

Mr. DONNELLY. Before asking Mr. Huggins about that, let me ask you this, Mr. Porter: In the extensive hearings which this committee has held on this subject the committee has furnished page proofs of the hearings from time to time to PUSOM, your organization. In addition, at the committee's direction, I addressed three separate letters to PUSOM inviting them to testify. On each occasion PUSOM declined.

I want to state that to indicate the fact that because PUSOM has not appeared here before has not been through any fault of the committee.

Your statement this morning that your organization was overruled and overridden by the district engineer and the contractor is a disturbing thing in the record as it has been made here. I know you would want to have it in proper context and proper perspective so that the committee would understand either that those situations were limited or else they were generalized.

DISCUSSION OF ISSUANCE OF STOP WORK ORDER BY HAROLD SIMMONS OF PUSOM

Getting into that, let me ask you this question with respect to Mr. Harold Simmons, who issued the stop work order at Sidi Slimane on June 9, 1951: Do you know whether PUSOM was dissatisfied with Mr. Simmons, its employee, as a man who was not competent to do the job which he had been given at Sidi Slimane prior to the time that this incident occurred?

Mr. PORTER. No. On a previous visit he seemed to be doing a good job. Also, the area engineer thought that they were working smoothly together. That was probably 10 days prior to this Simmons incident.

Mr. DONNELLY. Mr. A. R. Butler was engineering manager for PUSOM, was he not, Mr. Porter?

Mr. PORTER. Yes, sir.

Mr. DONNELLY. I have here a signed statement by Mr. Butler in which he says this about Mr. Simmons:

> During May, Mr. Jan Porel, general manager of Porter, Urquhart, Skidmore, Owings & Merrill, a joint venture which had been consummated earlier, directed that I get rid of Mr. Simmons in the near future because of incompetence for the job at hand.

Are you familiar at all with Mr. Porel or Mr. Butler's appraisal of Mr. Simmons' competence?

Mr. PORTER. In a general way. I think Mr. Severinghaus, the managing director of PUSOM since June of 1951, probably could answer that question more properly.

Mr. DONNELLY. I am not going into that to discredit Mr. Simmons as an individual, but in view of the fact that he was the principal in this particular incident I would like to have the record show what actually occurred.

Do you know whether it is a fact that Mr. Simmons and his wife were transferred from Sidi Slimane, he being relieved of his job as resident engineer for PUSOM, and that within a period of several weeks he and Mrs. Simmons both came back to the United States?

Mr. PORTER. Yes, sir.

Mr. DONNELLY. And filed a suit against PUSOM for salary, overtime, travel expenses and the like?

Mr. PORTER. Yes, I am familiar with the fact that he has filed a claim. It has not become a court case yet.

Mr. DONNELLY. It has not been in court.

Now, with respect to that material which Mr. Simmons found on June 9 to have been unsuitable, the material that had been laid there in one of the base courses, do you know whether that material was promptly removed by the contractor and replaced with suitable material?

Mr. PORTER. Not to my personal knowledge.

Mr. DONNELLY. Did you investigate it?

Mr. PORTER. I investigated, and the story of our inspectors was that it was not all removed.

Mr. DONNELLY. Now we have here a notation signed by the area engineer, P. M. Gill, in which he refers to a daily log or report of PUSOM dated June 10, 1951. That was the day after the unsuitable material had been placed. I quote:

PUSOM daily report of June 10, 1951, referring to location at which base had been placed the day before and signed by Mr. Simmons read as follows:
"Replacing inferior material which was removed."

Now, did you ascertain from Mr. Simmons or others in PUSOM's organization that work was under way to replace that inferior material?

Mr. PORTER. The report so states. I should state that my previous answer had to do with not a particular spot, but Mr. Simmons had reported on inferior material over a period of a number of days. The report may refer to the particular spot that was being placed on June 9.

CALIBER OF PUSOM PERSONNEL

Mr. DONNELLY. Mr. Porter, will your furnish the committee information showing the education, experience, and other qualifications of the key engineering personnel of PUSOM who were assigned to this Moroccan work?

Mr. PORTER. I have here a résumé of that type of information which I hope will be satisfactory.

Mr. DONNELLY. Mr. Chairman, may this document, produced by Mr. Porter, be inserted in the record at this point?

Mr. RILEY. Without objection.

(The document is as follows:)

GENERAL EXPERIENCE RÉSUMÉ, KEY ENGINEERING PERSONNEL, PUSOM—CONTRACT NO. DA–30–082–ENG. 5, AIRFIELD CONSTRUCTION, FRENCH MOROCCO

PUSOM overseas staff

American	476
French	51
Other European	39
Total	566
Engineering personnel	372
Architectural personnel	20
Total	392

NOTE.—This alphabetical list summarized the education and experience of key engineering personnel in various types of work (see organization chart for departmental assignment).

Soils, geology, laboratory testing, and pavement

Name	Age	Title	College degree	Soils	Experience		Remarks
					Geology	Paving	
Avci, H. K	26	Junior soils engineer	BSCE/MS soils	1 year	4 months		
Basil, F. E	40	Construction engineer	BSCE/MSCE	10 years	2 years	15 years	15 years. Responsible charge of construction projects, 15 years. 5 years airport work.
Beardsley, J. R	40	Senior inspector	BSCE			1 year	5½ years construction. 1 year concrete testing, design.
Beck, R. W	32	Soils engineer	BSCE	6 years		6 years	
Bennett, C. A	33	Engineering geologist	do	do	8 years		
Biggs, C	24	Junior soils engineer	BSCE/MS soils	1½ years	6 months		1 year teaching, 6 months survey.
Brady, T. S	65	Pavement specialist	2 years college			20 years asphalt.	
Brunegraber, R. F	23	Inspector	BSCE	2 years	2 years	2 years	
Bruner, J. P	36	Chief inspector	BSCE	3 years		12 years	Grading, foundations, and layout.
Burstyn, S. B	38	Field engineer	BS chemical, engineering/MS chemical engineering.	4 years		6 years	3 years grading.
Butler, A. R	45	Engineer-manager	BSCE	6 years		do	20 years' engineering experience; 14 years in responsible charge; 12 years' airport experience in responsible charge.
Causing, H. R	27	Junior soils engineer	BSCE/MS soils	1 year			3 years teaching.
Cittidini, L	34	Geologist	MSCE		10 years		
Clampett, R. D	58	Assistant constructor, engineering project.	BSCE	5 years		12½ years	Called on by CAA to do soils and compaction tests.
Dockum, G. F	51	Department engineer	BSCE			17 years (testing).	27 years paving.
Ellis, W. F	51	Designer	BSCE			8 years	9 years utilities, 2 years building design.
Eichhorn, R. A	32	Chief inspector	2 years college	6 years		6 years	11 years concrete, 6 years responsible concrete design.
Fischer, D	32	Designer	BE mining, MS credit/soils.	2 years		1 year	1 year water, 2 years topography, ½ year power line design.
Foster, R. K	26	Engineering assistant	BA geology	½ year	6 years		
Grigg, C. F	37	Assistant chief of design	BSCE	2 years		6 years	Railroad engineering, 9 years. Responsible charge=6 years airport engineer and 5 years railroad engineer.
Gustaferro, A. H	28	Designer	BSCE credit/MS	1 year		1 year	2 years teaching topography and civil engineering.
Hall, H. P	37	Department engineer	PHD soils	14 years	2 years	8 years (consultant).	
Harvey, W. P	47	Assistant department engineer.	BSCE			3 years	9 years construction design and supervision. Responsible charge.
Herring, N. B	27	Assistant department engineer.	BS Geology, MS physics.	3 years	1 year	1 year	

Holloway, F. L	41	Chief of design (acting chief construction engineer.)	BSCE	10 years		20 years	Formerly Chief of Paving, CAA, major portion of experience on airports.
Kenealy, J. P	27	Assistant department engineer.	BSCE	6 years		6 years	1 year general engineer.
Landau, I. R	24	do	BSME, BS soils	3 years			1 year water.
Logan, D. L	26	Junior soils engineer	BSCE	¾-year		½-year	1 year surveying.
Martin, L. L	33	Assistant construction engineer.	BSCE	11 years		11 years	11 years grading and paving. Soils and paving evaluation for CAA in Alaska.
McCreary, B. D	35	do	BS engineering, geology.	11 ye	7 years	11 years	11 years construction; 1) years responsible construction supervision.
Monteverde, J. A	28	Junior soils engineer	BA geology	1 year		1 year	
Murphy, M. C	22	do	BSCE	¾-year			
Pearson, H. M	24	do	BSCE	1 year			1 year grading.
Rich, J. A	36	Assistant construction engineer.	BSCE	4 years		4 years	8 years general construction. Worked on four airports.
Roberts, L. B	32	Office engineer	BSCE	2 years		3 years	10 years general construction.
Roguszka, E. G	25	Junior soils engineer	BS Soils	1 year	2 years		Worked on airfield evaluation, Alaska.
Rubinskey, E. I	27	do	BSCE, Masters, Soils.	½ year			2 years general construction.
Sass, J. P	31	Chief of Soils	BSCE, MS-soils	4 years	1 year	4 years	3½ years teaching.
Setomer, S. L	27	Junior soils engineer	BSCE, MSCE	3 years		1 year	
Shea, G. J	24	do		do			
Shimel, C. E	27	Designer	BSCE	2 years, MS soils.		2 years	
Theuer, A. U	46	Design engineer	AB in CE	5 years		22 years	
Winters, L	27	Junior soils engineer	BSCE	1½ years			

NOTE.—Figures for years experience are not necessarily cumulative as some experience overlaps.

Utilities and other design

Name	Age	Title	College degree	Experience	Remarks
Bach, G	25	Senior computer	BSCE	7 years highway design	
Conger, H. L	50	Constructing engineering projects	BSEM	22 years general design, 2 years geology	10 years airport design.
D'Emidio, J. A	29	Designer	BSCE	1 year utility design	
Flutch, L	53	Design engineer	BSEE	14 years electrical	5 years responsible charge.
Ford, J. L	32	Department engineer	BSCE	10 years general design, 4 years structural	
Griffin, H	46	Chief engineer	BSME	24 years general engineer	Formerly chief engineer, San Francisco District, U. S. Army.
Kelsey, E. R	48	Chief, electrical design	BSEE	23 electrical, 4 years mechanical	9 years responsible charge.
Klingman, G. J	56	Department engineer	BSEE	18 years electrical	12 years responsible charge.

Utilities and other design—Continued

Name	Age	Title	College degree	Experience	Remarks
Laurencot, R. E	27	Design engineer	BSEE, MSCE	2 years structural design	
Lyford, E. E	66	Department engineer	3 years	42 years electrical	Responsible charge for 35 years New Jersey license.
Morgenthaler, W	30	Design engineer	MSCE	1 year teaching, 1½ design structural	
O'leary, W. T	26	Designer	BSCE	1 year grading, ½ year drainage	
Page, R. E	52	Design engineer	BSCE	4 years design of utilities systems 1 year design water system	
Power, W. A	32	Department engineer	BEE	3¾ years electrical design	
Roggeveen, A	55	do	BSCE	25 years structural design	
Scacciaferro, S. J	46	Chief of design	BSCE	28 years design sanitary engineering	2½ years teaching.
Wilcox, C. W	45	Department engineer	BS, electrical	18 years general construction including hydraulics and sewerage.	
Woodley, T. J	46	Design engineer	4 years college	20 years electrical design	
Wooldridge, L. C	46	Department engineer	BSEE	15 years electrical design	

NOTE.—Figures for years' experience are not necessarily cumulative as some experience overlaps.

Grading, drainage, and paving design

Name	Age	Title	College degree	Experience	Remarks
Corn, H. M	29	Department engineer	3 years college	7 years general construction and drainage	4 years responsible charge.
Faries, R. B	43	Design engineer	BSCE	11 years railroad field engineering; 5 years drainage; 5 years utilities.	
Gray, W. S	49	Chief of airport design	BS, electricity; credit, administration and civil engineering.	23 years grading, drainage, utilities, and paving.	7 years airfield engineer work in responsible charge.
Molthen, R. S	26	Designer	BSCE	¾ year soils; 1½ years paving	Pavement and drainage design.
Summers, W. F	61	Assistant construction engineer (project).	BSCE	25 years paving; 36 years general construction.	
Vesely, D. J	28	Designer	BSCE	½ year soils; 2 years paving	
Yarrow, J. R	48	Chief of design	BSCE	16 years in airport work	

NOTE.—Figures for years experience are not necessarily cumulative as some experience overlaps.

General construction

Name	Age	Title	College degree	Experience	Remarks
Bassett, W. G	57	Assistant construction engineer (project).	BSCE	23 years general construction	15 years responsible charge.
Bruening, F. J	53	Assistant construction engineer	2 years	15 years utilities and pipe lay-out	
Diaz, H. J	49	Utility specialist		33 years plumbing and steam fitting	24 years responsible charge in management.
Dunham, J. E	33	Construction engineer (project)	BSCE	12 years general construction	4 years with CAA on airports.
Gorsline, J. S	36	Assistant project engineer		6 years inspection concrete and mechanical installations.	
Hanna, M		Project engineer		25 years piping, air-conditioning, water supply, steam.	8 years responsible charge.
Hill, A	31	Assistant construction engineer		12 years general construction	
Jenkins, N. B	50	do	5 years	27 years general construction	15 years responsible charge; 5 years area engineer, U. S. Army, Cincinnati, Ohio.
MacDonald, W. A	42	do		16 years general construction	5 years responsible charge.
Mulligan, J. K		do	4 years	28 years general construction	12 years responsible charge.
Otto, G. E	44	do		32 years electrical	25 years responsible charge.
Pierce, J. E	43	do		22 years construction	7 years responsible charge.
Reimer, F	53	do	BSCE	32 years general construction	25 years responsible charge.
Ruddel, H. F	47	do		15 years mechanical maintenance and construction.	10 years responsible charge.
Sanel, E	48	Construction engineer	BSCE	25 years construction, 8 years pavement, 1 year geology.	15 years responsible charge.
Thompson, G. E	59	Assistant construction engineer		18 years general construction in electrical	Do.
Travis, L. M	49	Project engineer		17 years general building construction	Do.
Veit, F. F	44	Assistant construction engineer	BSCE	20 years general construction, primarily tunnel work.	10 years responsible charge.
Villani, N	54	Assistant project engineer		10 years building construction	Do.

NOTE.—Figures for years experience are not necessarily cumulative as some experience overlaps.

DISCUSSION OF DEVIATIONS FROM SPECIFICATIONS AND OVERRULING, ETC., OF PUSOM

Mr. DONNELLY. Now, what is your testimony as one of the principal representatives of PUSOM with respect to this very important matter of whether specifications were deviated from and whether PUSOM, the architect-engineer, was overruled or overridden or ignored? Would you give the committee the benefit of your full views, putting them in proper context, for the whole job?

Mr. PORTER. Well, I think that statement is substantially true. I believe that a number of letters sent to the District engineer have been filed with various committees, covering our viewpoint.

With your permission, I would like to suggest that Mr. Severinghaus cover this point, as he and the general manager have signed specific letters on this point.

It is certainly true that specifications were not followed during the rush work in many instances.

Mr. DONNELLY. Would you identify the periods of time which you would associate as rush work?

Mr. PORTER. Well, rush work, so far as I think our files show, extended on through practically the entire year, or until some time in December.

Mr. DONNELLY. Would you tell us which form the specifications took that your organization felt were deviated from?

Mr. PORTER. Letters that have been submitted to the committees I think point out a number of cases. Evaluation tests confirm that such things occurred.

First, the prime coat, considered essential by Mr. Griffith and by most civil engineers, if not all of them, was omitted on most of the aircraft utilization areas up until some time around November or December.

The rock production of base materials did not conform with original specifications. Modifications were made by the district engineer that permitted 15 percent of fines instead of 8 percent of fines at Nouasseur, and permitted 12 percent of fines instead of 8 percent at Sidi Slimane. Even these modified limits were not complied with throughout. That is one of the reasons why we have a substandard base, as found in the evaluation.

Mr. DONNELLY. What do you mean by fines?

Mr. PORTER. Material or fines passing a 200-mesh sieve, or the dust and clay content.

Mr. DONNELLY. You have referred to three specific types of specifications. The first was that first coat of asphalt which would go over the base course. That was deleted, as I understand it.

Mr. PORTER. Yes, sir.

Mr. DONNELLY. Was that not deleted by a decision of the district engineer to attempt to combine that and the second course of asphalt, which would have been laid in due time?

Mr. PORTER. I did not know of his proposing to combine it in any other layer. The prime coat is a coat placed on a base and allowed to penetrate in order to get a proper bond between the asphalt base course and the underlying base materials.

Mr. DONNELLY. With respect to the deletion of that prime coat, was it your understanding that it was the decision of the district engineer to eliminate it?

Mr. PORTER. Yes, sir.

Mr. DONNELLY. Was the contractor involved in that decision in any way that you know of?

Mr. PORTER. I cannot say. We have a letter from the district engineer, I believe, in the latter part of July, which directed the contractor not to put on a prime coat.

Mr. DONNELLY. Now, with respect to the second and third categories of deviation—that is, the 15 percent of fines instead of 8 percent at Nouasseur, and 12 percent instead of 8 percent at Sidi Slimane—did you regard your specification as a feasible one, the 8 percent requirement, in view of the unavailability of much of the screening and other types of equipment needed?

Mr. PORTER. No; I think it was generally feasible. It is also the usual guide. The usual specification that engineers use on that class of base course is to insure that there were not too many fines which might take up moisture and tend to weaken the base.

Mr. DONNELLY. Do you know whether the contractor had the equipment which would permit him to comply with those particular specifications?

Mr. PORTER. The situation at Nouasseur was one that the quarry had insufficient fines, and excess fines occurred due to the speed-up program where they were authorized to put in the overburden materials; that is, the loose rock, sand and silty soil that overlaid the quarry. That, of course, increased the capacity of the crushers, because they did not have to crush so much, and also resulted in extra fines.

At Sidi Slimane the pit was at times rather high in fines, but the general run of it, eliminating the clayey pockets, was normally within the limit.

Mr. DONNELLY. Well, now, taking into consideration your view expressed here that the specifications were deviated from, taking that into consideration and taking into consideration the over-all conditions of the job and the type of equipment and the construction plant available and the time element, is it your opinion as the architect-engineer that the contractor, Atlas, did a good job, a mediocre job, or a poor job?

Mr. PORTER. Well, I would rather reframe your question to say we know that we have a mediocre job here due to one cause or another. The evaluation tests show that we had a job which requires some repairs.

QUALITY OF WORK IN VIEW DIFFICULT CIRCUMSTANCES

Mr. DONNELLY. Mr. Porter, the role of an architect-engineer generally is to supervise and evaluate the construction of the contractors. The Government has paid a fee or obligated itself to pay a fee for the work which was done by PUSOM as architect-engineer.

Now, if you take into consideration the limited time within which procurement was possible in order to set up the material pipeline; if you consider the impossibility of procuring standard plants and standard equipment and putting together a bunch of hybrid types of equipment; if you consider the fact that your work of making up plans and specifications under the Air Force proceeded concurrently with construction operations; if you consider the fact that there was a

limited time within which to test out subsurface conditions and such matters as drainage and the like; if you consider the fact that work crews and the top-level personnel and all echelons, as a matter of fact, work at 70 or 80 hours a week for over a period of many months; if you consider the climatic conditions, the lack of housing, the absence from surroundings here in the United States, in that type of country; and if you consider all of those things and then look at the job which you describe here as "mediocre," do you feel that the contractor fell down on the job, or what would your opinion be?

Mr. PORTER. Well, I think that with all the difficulties the job as a whole sets a record that has never previously been reached or approached, even in my experience during wartime. When I said "mediocre" I should have said that we have some weak spots. So, looking at it from that angle, we certainly do not have as weak a pavement as we have had sometimes during wartime, even though the work was not carried out as fast and with as many difficulties as it was in this case.

Mr. DONNELLY. I might have added a few more factors. Perhaps I should. Namely, this was the first venture of this country into this type of construction in peacetime in a foreign country, and this was almost our maiden experience with the French, and the problems created there through the French Liaison Mission and other related problems in a foreign land over which our Government had no control are involved.

Mr. PORTER. I might add that those are very, very major things which the congressional committees should consider, as to how as a Nation we can operate with the other nations in a way that the agreement eliminates future misunderstandings.

Mr. RILEY. Mr. Porter, would you classify our agreement with the French as being more or less of an over-all policy with the details to be worked out on the ground, or do you think there were misunderstandings from the beginning?

Mr. HUGGINS. Mr. Riley, could we keep the testimony on the French off the record; or at least not print it in the public record, if you want to print it in the committee record?

Mr. RILEY. The question which arises in my mind, Mr. Huggins, is this, and if I have the wrong impression I would like to be corrected: The original agreement with the French was one of a more or less general agreement with the details to be worked out on the ground, which would not be so much a matter of misunderstanding as a matter of difference of opinion.

Mr. HUGGINS. No. I think the original agreement with the French was more than that. There were basic elements in it which have still given rise to a lot of disagreement and misunderstanding. I would be glad to go into that broadly. It is all part of a very broad picture. But, as I say, I would not want to do it on the record.

Mr. RILEY. Off the record a minute.

(Discussion off the record.)

Mr. RILEY. I would certainly like for this to be clarified. From the testimony which we have had I am definitely of the opinion that there were a great many details to be worked out on the ground.

Mr. HUGGINS. There always are; I agree with you.

Mr. RILEY. I would not call that a disagreement so much as a difference of opinion as to how those details could be reconciled.

Mr. HUGGINS. Off the record, if you will.

(Discussion off the record.)

Mr. DONNELLY. Mr. Huggins, in view of the policy and desire of the Air Force to get bases built in foreign countries in peacetime—and in carrying out that policy the Moroccan air base construction was the first, as we understand it?

Mr. HUGGINS. One of the first.

Mr. DONNELLY. I believe the Air Force filed a brief which said this was the first venture on foreign soil in peacetime.

Mr. HUGGINS. The other I have in mind is Blue Jay, which was contemporaneous.

Mr. DONNELLY. In view of the desire and policy of the Air Force to get these bases built overseas, and the conditions under which the work must be undertaken and executed, which have been discussed in this record through the months and again today, does the Air Force feel that in the case of the Moroccan air base construction it has gotten less than it was entitled to, under all the conditions under which the job was initiated and the conditions under which it was carried out?

Mr. HUGGINS. The answer is "Yes." We do feel we have gotten less. To go further, I think the fault for that lies with all of the organizations involved, including the Air Force. I don't think they did as good a job as could have been done. After all, everybody knew it was a rush job.

Mr. DONNELLY. Well, have the deficiencies in the Air Force been of a nature that this committee and others can take note of them and profit by them and consider a lesson has been learned in this venture, or is it more serious, is it something the Air Force is so concerned with that the Air Force would like major changes in this type of operation?

Mr. HUGGINS. No, I don't think we want major changes. I think the situation in Morocco has disclosed a number of weaknesses which everyone, so far as I know, is attempting to eliminate, both Morocco-wise and from a general standpoint. I think our major weaknesses—by "our" I mean the Air Force—lie partly in the scope of the base problem. We have got there involved planning of close to $9,500,000,000 of air bases in the course of the last couple years all over the world. Our weaknesses lie in lack of enough personnel and adequately trained personnel. That is not one we can overcome very easily.

I think some of the organizational weaknesses within our own organization have been disclosed, and I think we have taken steps to button those up. I don't mean to imply that all of our problems are licked, by any means.

BASIS FOR ESTIMATE OF CORRECTIVE ACTION AT SIDI SLIMANE

Mr. DONNELLY. Going to your statement with respect to the cost of repairs or corrective action at Sidi Slimane, you indicated it would cost several million dollars. Is that view on your part based on an engineering estimate, or is it based on just a general guess on someone's part?

Mr. HUGGINS. There are no engineering estimates that I know of. That is a pure guess, and various people guess different amounts. That is based upon reports of our people in Morocco, and also upon the review made of the information we received the latter part of

August from Dr. Buchanan, who, at our request, came here 3 or 4 days before the university opened, to sit down and talk over it with us.

Our information indicates that there will have to be more evaluation following the use of the 200-ton roller. It is our understanding that it is contemplated that the use of this roller would compact the subbase so that the use of a 2-inch overlay of asphalt would do the work.

It is our understanding that it was computed that the CBR's of the base course should come to 55 before the 2-inch overlay would be satisfactory. I think the only statement we have as to actual results was on 11 CBR's taken, which are inadequate for a full evaluation. Of the 11, 1 was 55 and the others ran from 52 to 14, with the majority around 30.

I think it was in the light of that information that Dr. Buchanan stated that the minimum corrective measures would not suffice, and the estimate of General Pick is not realistic, particularly at Sidi Slimane. He added that on the basis of this it had to be recognized that there was a potentiality of having to resort to maximum corrective measures rather than minimum corrective measures.

This was handed to me just before he left for Texas, and I didn't get to discuss it with him.

Mr. McGrath. Did Dr. Buchanan go to Morocco?

Mr. Huggins. Yes, he was there with Mr. Pringle and Mr. Philippe in July, and I believe their views as to the problem were unanimous. So far as I know, their report is not yet complete, so that other than conversationwise, we do not have anything specific as to their views. General Hardin testified $1,160,000 was the minimum.

Mr. Riley. What is Dr. Buchanan's position with Texas A. and M.?

Mr. Huggins. He is a professor on soils, and he is running a special course on airfield pavements for Air Force officers, and anybody else who wants to take it.

Mr. Riley. He is with the engineering department there?

Mr. Huggins. Yes. Incidentally, I might add, after reviewing this information, Dr. Buchanan said he thought he had better go back to Morocco. We asked him to go back right away, but with his university starting he couldn't. He may go later in the fall.

We have got to come back in and ask Congress for more money, and we don't want to ask for an unrealistic amount.

Mr. Donnelly. Did Mr. Buchanan have any information other than the information, study, and evaluation of Mr. Porter, PUSOM, in this opinion he expressed to you?

Mr. Huggins. This opinion is based not on the information on which the $1,160,000 estimate was based. This is based on the reports of the results of the rolling, including the 11 CBR's that I mentioned here. It is a post-report, if you will, and not the basic report.

He was over there with Mr. Pringle and Mr. Philippe, and I think they can testify as to the exact scope of the information on which their basic report was based. It is our feeling at the moment that the time is premature to try to come up with a sound estimate as to what the cost of repairs will be.

I might add one other phase that makes us wonder about the $1,160,000. I think Mr. Porter testified there might be 8 percent of

the pavement that might have to be dug up. If we assume 1 million square yards, 8 percent of that at $10 or $15 per square yard, probably $15, you get up to over $1 million at Sidi Slimane.

I believe the $700,000 is simply the cost of the overlay, without the cost of the other basic work before you get to the overlay. We don't see, on that basis, plus the reports that we have had as to the results of the use of the 200-ton roller today, that the minimum figure mentioned can be met.

Mr. DONNELLY. The Maxon group, in their report to the Secretary of the Army, reported on pages 37, 38, and 39, their conference with Colonel Barnett, Air Force liaison officer for French Morocco and East Atlantic division. I am reading from page 38:

> We asked Colonel Barnett if he had a field inspection force. He advised that he has a representative at each of the three bases now under construction. He stated that in his inspection procedure whenever a deficiency is brought to his attention it is immediately settled by calling the matter to the attention of the inspector who had overlooked it. The tests that had been made at the Sidi Slimane and Nouaseur bases were then discussed. He said he is satisfied with the tests and further stated that he is not in favor of tearing up a lot of pavement nor does he favor the spending of large sums of money to correct the reported deficiencies.
>
> Specifically, Colonel Barnett stated that in his opinion the south operational apron at the Nouasseur Base could be used in its present condition by making some minor repairs in the worst spots and taking care of the drainage. The operational team was impressed with the frankness with which Colonel Barnett discussed his functions.

Mr. HUGGINS. I think, looking at the date of that, that was prior to the rolling.

Mr. DONNELLY. The date was Saturday, August 9.

Mr. HUGGINS. That is right, and I think the rolling results have come in, they certainly have come in to us, since the middle of August; and I know that Dr. Buchanan feels that such tentative reports as we have to date probably are erroneous. The tests that are referred to there, I believe, are the CBR tests which were taken over a period of several months. They are not the tests which were made after the rolling which indicate the CBR's went down rather than up to the 55 which we understand is the basic. The figures I gave you before were the result of 11 CBR tests. They come from one of Colonel Barnett's reports, and he states:

> This is based upon the results of the first rollings. The writer is of the opinion that only "dental work" plus a seal coat should be accomplished this fall.

Sidi Slimane is the only base I am talking about here. He states it is felt that the experience of one more rainy season should be undergone before further research is made.

His other reports indicate that he is very much concerned, necessarily based upon incomplete information. He is worried about basic weaknesses underneath which will not be corrected by a top coat.

Mr. DONNELLY. Did Mr. Buchanan make a written report?

Mr. HUGGINS. He gave me a one-page report which I did not have a chance to question him on, and which is based solely on some of the figures I have been giving you here.

Mr. DONNELLY. With respect to the cost of repairs, you testified that you intended to or had consulted Senator Johnson of the Senate

Armed Services Committee with respect to the expenditure of funds for repair work.

Mr. HUGGINS. Major repair work.

Mr. DONNELLY. The testimony that we have had from the Corps of Engineers is to the effect that the repair work indicated here by the architect-engineer and by the corps is within the line item cost of the pavement for the various runways, taxiways, and aprons.

Is it the Air Force's position that that work should not be undertaken within the line item cost without further clearance by congressional committees or further appropriations by Congress?

Mr. HUGGINS. I think that is the position. In the first place, we are not sure of what the costs of the pavement are and have been. The costing records, certainly in the early days, were such that it is very hard to tie them in to a figure.

Senator Johnson's position was that we should not use funds appropriated for initial construction for major repair work. There was no indication on his part—the subject did not come up, but there was certainly no indication—that repair work which might come within the initial line item cost could be made without his approval. We contemplate coming back to Congress to ask for additional money for major repair work.

Mr. DONNELLY. Does that view apply to the $1,160,000 estimate of the architect-engineer and the corps?

Mr. HUGGINS. I think it does. I certainly would not feel that I could say, "Go ahead and spend the $1,160,000," without writing a letter to Senator Johnson and giving him our views and what we wanted to go ahead and do. We don't know what the right figure is. This $1,160,000 is——

(Note.—General Pick suggested a question which Mr. McGrath rephrased as follows:)

Mr. MCGRATH. I take it, Mr. Huggins, you have confidence in the Corps of Engineers?

Mr. HUGGINS. Yes. We would not be providing money for the construction of the bases if we didn't.

Mr. MCGRATH. I think that answers the question.

Mr. HUGGINS. The information here is based on subsequent information to that on which the original estimate was based.

Mr. MCGRATH. Which information is fragmentary?

Mr. HUGGINS. That is correct. We don't know what it will cost.

Mr. MCGRATH. And you have testified that the Air Force is not set up so that it can give us a breakdown as to cost; is that correct?

Mr. HUGGINS. It is not; that is correct.

Mr. MCGRATH. Does that answer the question you have in mind?

General PICK. Yes.

Mr. DONNELLY. I would like to ask this: Does the emergency still exist? Does the Air Force still feel that the bases should be placed in operational use at the earliest feasible date?

Mr. HUGGINS. The crisis aspects are off the program. These bases were built and are being built for use tomorrow, if we have to use them tomorrow. We would like to get them as soon as we can.

Mr. DONNELLY. It was testified that the corrective work on 4,000 feet had been stopped on orders of General Old.

Mr. HUGGINS. On the rolling.

Mr. DONNELLY. Which was the type of corrective work the Corps of Engineers thought should be done?

Mr. HUGGINS. Yes.

Mr. DONNELLY. Has the Air Force taken the position that all the corrective work which the Corps of Engineers and the architect-engineer have decided should be done will not be done?

Mr. HUGGINS. No. That decision by General Old was on the basis he wanted runways of sufficient smoothness to handle heavily loaded bombers.

General WALSH. Mr. Chairman, could I add a word?

Mr. MCGRATH. Yes.

General WALSH. We had a conference with General Old on how that rolling should be done so as not to interfere with operational activities by him, and the agreement was that we would roll first 4,000 feet at the west end, then the 4,000 feet at the east end, and finally the intermediate 3,000 feet. Also, as a part of our program, immediately following the rolling of a portion of the runway, we wanted to put down the leveling course and then any strengthening course that might be required. After General Old advised that he had received word from Mr. Huggins that funds could not be used for that leveling course work, then it was that Colonel Campbell stopped the rolling, on other parts of the runway, for fear we might develop some bad spots, and proceeded to do his rolling on the apron, where a little irregularity did not make any serious difference from an operational point of view.

Mr. HUGGINS. I might say the use of funds for the so-called dental work was authorized. That has been authorized all the way through, with the knowledge and approval of Senator Johnson.

General PICK. I believe I understood General Walsh to say he worked out a program with General Old whereby he could work and roll on one end of the runway, and General Old would still have a portion of the runway for operational activities; is that right?

General WALSH. Yes.

General PICK. So the fact he had rolled 4,000 feet was not deviating from the plan?

General WALSH. It was in accordance with the plan.

Mr. HUGGINS. He stopped rolling on the other part of the runway.

General PICK. Whom did he notify to stop the rolling?

Mr. HUGGINS. Colonel Campbell.

General PICK. When?

Mr. HUGGINS. I believe I read from a letter of August 26.

Mr. MCGRATH. Received on August 26.

Mr. DAVIS. We had that testimony here this morning, General. Weren't you here?

General PICK. Yes. But the engineer in charge of the work didn't know it.

Mr. HUGGINS. I might add, along that same line, I find I also had a cable dated the 25th of August, which I will paraphrase a bit. General Old requested the engineers to discontinue testing on the runway after

4,000 feet were completed, in order to keep the runway operational. Conditions developed that placed a severe strain on the runway.

Mr. DONNELLY. What is the latest information on compaction at Sidi Slimane?

General HARDIN. As the Secretary stated, there has been a period of rolling which went on after our last visit to Morocco that was contemplated in the plan of operations, the rolling being to improve the subgrade and also the base course, and, as stated in our plan, the results of that rolling were to be reevaluated before the pavement thickness was determined.

Some preliminary data has been obtained from the rolling of that 4,000 feet of runway. I don't know what amount of data Mr. Huggins has been furnished, but we do have the test results of a considerable number of test pits, and we have been evaluating that information in the last week or so, Mr. Porter having brought the latest information here, and conferences have been held on the subject.

I think that it would be not in keeping with the nature of this problem to jump at conclusions on the basis of a few CBR results. I think that in this kind of a problem the matter has to be approached in a thoroughly controlled fashion, otherwise you will get misleading conclusions.

Now, we have found that since the compaction effort with this heavy roller has been reported, that the test results have been inconsistent to a degree that we are having difficulty reconciling with full knowledge of a good many years of experience in this sort of thing. The results, which are at times of a low character such as Secretary Huggins has mentioned, are not in keeping with the percentage of fines passing the 200-mesh screen, and we find there is further consideration necessary before we should begin to feel concerned about these deviations to a degree of saying that our previous conclusions are worthless.

Now, the same material that the Secretary has been referring to, and I believe a great deal more of it, has been made available to us through our regular channels, and not only to us, but to PUSOM, who are our agents, of course, and the conclusions we have reached tentatively you heard expressed this morning, in which we fully concur, that even though there may be a lesser degree of supporting value to this base than we anticipated to get a CBR of 55, still the margin of hazard is not such, in our opinion, to lead to any conclusion that the cost of this work will be so greatly magnified.

We have instituted measures to reconcile these inconsistent low reports, and both the architect-engineer and the Corps of Engineers have been thoroughly alerted to the necessity for further study along this line, and we are doing so at the moment.

I will say that we are greatly hampered in coming to proper conclusions by not being able to roll and compact the portion of the runway which had been planned, and I feel that our effort in that regard is only going to be delayed to a degree which will make it difficult for us to arrive at proper conclusions in a reasonable length of time.

Mr. RILEY. Is the runway at Sidi Slimane being extensively used by the Air Force at the present time?

General HARDIN. I don't know that. I believe General Walsh could answer that better than I.

General WALSH. Yes; it is being used to a considerable degree, and the Air Force had planned, around the first of October, some additional

use of the runway for training purposes, and our plan of operation there had taken that into consideration when we discussed the procedures with General Old.

Mr. RILEY. I was wondering if there would be a period when the Air Force could forego the use of it to give opportunity for a proper test with this compactor so that the results could be evaluated.

Mr. HUGGINS. I can't answer that, Mr. Chairman. The plan, I believe, was to keep 7,000 feet at one end of the operation while you worked on 4,000 feet, and then you would have 3,000 feet in the middle.

I assume from the communications from General Old that his request that the work not continue on the runway was based upon his feeling that there would be a good deal more dental work that would have to be done after the 4,000 feet which have already been rolled, but I have not queried him at any length on that. I have taken his statement at face value.

General WALSH. I would like to add a comment. The amount of dental work that was indicated by the rolling of the first 4,000 feet, as Mr. Porter mentioned, was considerably less than the minimum of 5 percent that he has used in working up his estimate.

Mr. RILEY. You would not know, Mr. Huggins, whether or not General Old wanted to suspend this operation so as to have use of the runway for training purposes, as indicated here, or whether he thought the repair work was more extensive than he had anticipated?

I thought that he might be holding up the tests until after this training period and he did not want too many waves in the runway there while the training period was under way.

Mr. HUGGINS. I think General Old's basic underlying motive is that the runway should be kept operational at all times in case it has to be used. That particular operation of the Strategic Air Command is on a 24-hour alert, 7 days a week. They have to be ready to move at a moment's notice.

(Discussion off the record.)

Mr. RILEY. What are the qualifications of Dr. Buchanan of Texas Agricultural and Mechanical College? Has he had practical experience as well as technical experience?

Mr. PHILIPPE. Dr. Buchanan has had both technical and practical experience in this particular phase of engineering. He graduated from the engineering school in approximately 1927. Since that time he was an employee of the Corps of Engineers and in charge of their soil laboratory at the waterway Experiment Station until about the time of the war, at which time he became an officer in the Corps of Engineers and served in the construction of airfields in the South Pacific. After the war he went with Texas Agricultural and Mechanical College as a professor in soil mechanics and enjoys an enviable reputation as a teacher and as an engineer.

In addition to that, he is head of an engineering firm which practices in Texas and operates, I believe, under his name, together with some other partners, and he also there enjoys an excellent reputation as an engineer.

He is fundamentally sound from a theoretical standpoint and has ample practical experience.

I believe as far as we in the Corps of Engineers are concerned, we believe that Dr. Buchanan is a well-qualified engineer.

I would like to add this: I have been together with Dr. Buchanan throughout all of these discussions. Most of the time we were together. The basis upon which we made these calculations has never been in question. They are based upon investigations which the Corps of Engineers has conducted for the Air Force over many years, and our methods are mutually acceptable. I do not think there is that to be questioned at all. So, when it comes to making a calculation on any specific test result, you can be sure that Dr. Buchanan would use the same general methods that I would, and I am sure those are the same methods that Mr. Porter has used.

So, when Mr. Porter places a pessimistic estimate for Sidi Slimane, I am sure that the methods that he has used make those calculations in thickness are the same that I would use and that Dr. Buchanan would use. Therefore, the only thing that remains in question is how Mr. Porter assembled his estimate on the basis of his figures of cost, but not those of technical significance.

EXTENT OF REPAIRS TO BE MADE AT SIDI SLIMANE

Mr. RILEY. I understood Mr. Porter to say about 8 percent of the runway at Sidi Slimane would have come under repair and that after this 4,000-foot runway had been rolled with this compactor about 5 percent reparable sections had developed. Am I correct in that, Mr. Porter?

Mr. PORTER. Even less than 5 percent showed signs of trouble. One sample of 23 shows excessive clay; in other words, that is only between 4 and 5 percent. The 8 percent was a high figure for digging out bad spots based on our numerical consideration of the 2,000 or 3,000 tests that we have made on that field.

Mr. RILEY. In other words, you think 8 percent is a liberal figure?

Mr. PORTER. Yes; for digging out the bad spots.

Mr. RILEY. Mr. Philippe, you have not had occasion to make your own estimates in that regard, or have you?

Mr. PHILIPPE. Yes, I have.

Mr. RILEY. How high would you say the percentages would run?

Mr. PHILIPPE. I think that I am in agreement with Mr. Porter in that respect. I think we examined the same information and came to the same conclusion.

Mr. RILEY. You think that 8 percent would be ample?

Mr. PHILIPPE. I think that 8 percent on the average over the entire field would be a good figure; yes.

Mr. RILEY. Naturally, some would run less than the others, but we are interested in the over-all figure, and if you think that 8 percent would be ample then we have a basis upon which to move.

Mr. PHILIPPE. Yes.

Mr. RILEY. Mr. Rowe, I believe you have had considerable experience in road building and air-strip building; is that correct?

Mr. ROWE. Yes.

Mr. RILEY. In your opinion, can these waves or depressions be successfully eliminated by a resurfacing with bituminous concrete of the proper thickness, or would they appear again after a period of time—assuming, of course, that the compaction was adequate?

Mr. ROWE. I might say, Mr. Chairman, that I am only a contractor and not a soils expert. I do have every confidence in Mr. Porter and

his organization to go through with what they have started and bring up the proper result. I likewise have confidence in the ability of the Army engineers to assist Mr. Porter and to interpret correctly the recommendations that he brings up.

I have been in the highway-building business since 1919, and in most of that period of time I have been building concrete roads and have not been in the repair business.

Mr. RILEY. Have you had any experience in resurfacing highways?

Mr. ROWE. No; but I have had experience in resurfacing runways, and the recommendations that have been made here today are in line with practice that not only have we performed but I have seen others here in the States perform the same practice for the same kind of use that is proposed in French Morocco, and I think this procedure is on a firm basis.

NEED FOR INITIATING CORRECTIVE MEASURES AT AN EARLY DATE

I would like to say further it is my observation that unless these corrective measures are initiated at an early stage they will have some bad weather over there in French Morocco and they will not be able to do anything on them until next year. Time is of the essence in this whole program as well as everything else.

They have three 200-ton rollers over there, and they could move them all over to Sidi Slimane and roll the whole business in about 24 hours, more or less. They likewise have 12 asphalt spreaders, as I remember—something like that—over there, and they have the asphalt capacity. They would have to move the other asphalt plants back up there; they have only one at Sidi Slimane at the present time, but at any rate, the whole thing could be handled in the next 30 days. It could all be done. They have an air base down at Ben Guerir also that is ready to be used operationalwise. It seems to me that the Air Force might fly some of their planes over there. They have camp facilities. They have a kitchen already there. All they would have to do would be to take the boys over. They would have a place to feed them and a place to fly the planes while they are making the repairs. There is nothing complicated about the whole procedure at all if somebody would give the people over there the sign to go ahead and do this thing instead of all this pecking around.

Mr. RILEY. In your opinion, if the contractors and the engineers had 30 days' freedom they could do the repair job and get it over with?

Mr. ROWE. If you would give the contractors, the Corps of Engineers, PUSOM, or the Air Force the responsibility of making the correction and then have somebody do it. We are wasting a lot of valuable brains here, it seems to me, in these pinpoint discussions.

Mr. RILEY. Mr. Bonny, do you think that you could do it in 30 days?

Mr. BONNY. We could give it a fairly good try.

Mr. MCGRATH. Can you answer the chairman's question? Do you think that in 30 days you could get the job done?

Mr. BONNY. I am not prepared to say 30 or 31 days. We could give it a good try in 30 days if we had the equipment to put on it.

General HARDIN. I would like to add something here. If you were mobilized to do the job, you could do it in 30 days. The trouble now is to move the equipment there at this late time of the year and to get the materials there in order to do the job. I am very anxious to get

it done; but, as I stated, I am afraid that you will have to consider the 30 days from the time that you are ready to go to work.

Mr. HUGGINS. There is also this factor: Insofar as the operational exercises are concerned, those can be called off. Whether they ought to go to Ben Guerir or not, I do not know. We told the Corps of Engineers that we would keep all the Air Force people we could out of there so that they would not have operations bothering them. Whether there is the fuel and so forth to handle it at Ben Guerir, I do not know.

We do have the problem of money. Government financing is very difficult, as we all know. Senator Johnson put the condition on the use of the funds that we now have available.

Mr. ROWE. Call the Senator up.

Mr. HUGGINS. What I want is information that we are pretty sure of before I do. He is going to want to know what it is going to cost.

Mr. ROWE. You will never find any more experts here than there are today. Pardon me, Mr. Chairman.

Mr. RILEY. I agree with you. I think that we have as good brains here as we will have anywhere in the country.

How long would it take to move the equipment down there, General Hardin, and get the materials on the ground? Could that be done and give you 30 days before the rainy season arrives?

General WALSH. I do not believe that we could move the additional asphalt plant in and get it set up and working before the rainy season. You have to count on heavy rains from the 15th of October on. We have had two rains already, one the day before I left. I am little fearful that we could move the plant and get it set up and ready to work without running into the rainy season.

Mr. RILEY. It seems to me then that this delay is going to run us into the rainy season and make more repair work by spring. Would that be a proper conclusion?

General HARDIN. I do not believe there is need for concern on that in this respect: It was our plan, as you will find in General Pick's memo dated the 20th of August, that we would roll these surfaces thoroughly and we would do what we referred to as the dental work this year and we would do as much of the required overlay as the plant capacity would permit, and we thought that we could get it done if we were able to go ahead with it while we were over there. However, the risk of not getting it done is not one from the standpoint of getting it wet. We actually think that if it does get some additional moisture in the material under the asphaltic pavement there will be then means for obtaining a higher degree of compaction possibly than we are able to get now because of what is termed "the optimum moisture for the soil." You have to have a certain degree of moisture to get maximum capacity. In those areas where there are clays, it will be easier for the rolling process to develop those pockets in there if they get wet.

Now our concern is not about these waves and depressions because they were the things which were going to be dug out if we were allowed to roll the surface. That was one purpose of the rolling. We could continue to do that work of rolling and compacting and doing the dental work this year even if it is impossible to do the overlay.

Mr. RILEY. Would the field still be operational?

General HARDIN. I am satisfied we can keep the field operational. I would like General Walsh to answer that.

General WALSH. I feel that if we are permitted to put on the leveling course——

General HARDIN. The leveling course is only a little bit more than a patch. It becomes a big patch, maybe a hundred feet long instead of 5 feet.

Mr. RILEY. I think that someone should make a decision and get this thing going.

General PICK. One reason why they cannot put all the equipment on this particular work is because there is a large program for new pavement work going on over there and they have to keep a large portion of this equipment on that work in order to get that finished before the rains come this year.

Mr. RILEY. Where are you paving, Ben Guerir? Are you paving roads?

General PICK. Ben Guerir, Nouasseur and Sidi Slimane, additional paving. Now the question of doing the work: I believe it would be advantageous and in the best interest if we are allowed to do everything that it is possible to do this fall. There are some things that we could have done if we had had the money. I foresaw that when I returned from over there. I discussed the matter with Mr. Huggins a day or two after I got back and asked him if there was any way that he could get the funds made available to us for this work. He has not been able to get those funds allocated up to this time. In some of the area we have already taken steps to make such corrections as we can under the limited program which we were permitted to work under. I concur in the statement of Mr. Rowe, the quicker the repairs are made the better off everything will be.

Mr. RILEY. From a layman's standpoint I concur in that too.

QUESTION AS TO MAXIMUM COST OF REPAIRS AT SIDI SLIMANE

Mr. HUGGINS. I would like to ask a question, if I may. I believe that the committee of three experts, Mr. Philippe, Mr. Pringle, and Dr. Buchanan, who reviewed all these tests, have both a minimum and maximum program of what might be involved, depending upon what developed. The minimum program is that reflected in the $1,160,000. Has any price tag ever been put on the maximum program?

Mr. PHILIPPE. No, sir. As a matter of fact, I think there is a mistaken impression about the minimum and maximum figure. That may have been done since that time, but it was not done than. Actually, the figure of 55 CBR for the base course is more or less mysterious. At that time we realized that we ought to make some estimate of the cost and we ought to have some basis upon which to make that estimate, so we reviewed the figures as best we could, and as lean as they were, and the three of us came to a conclusion on which we all agreed that the best probable working value we could select at that time was 55, and we made on our calculations on that basis.

At that time we did not speculate about other valuations and whether it would be greater or lesser than that. That was our best estimate at that time.

Mr. RILEY. What is the dollar figure associated with the 55?

Mr. PHILIPPE. The dollar figure associated with this 55 is the $1,160,000.

General PICK. The figure included in the report that I gave the Secretary.

Mr. PHILIPPE. Yes. Since that time we have had these figures that General Hardin has talked about and we have made an estimate of qualify, if you will, based upon those test results, and from that we have calculated the thickness of the pavement that will be required if that condition were to obtain, and, as Mr. Porter indicates, it approximately doubles the thickness that is required over that submitted by General Pick, and that results in his top estimate, which is approximately $1,800,000 for the two jobs.

So, based upon the figures available to us now, we are talking of a range in values between $1,160,000 and $1,800,000.

Mr. RILEY. I am responsible for asking for that maximum figure because I would rather know the worst now.

Mr. HUGGINS. I asked for it just now because I am trying to figure what to say to Senator Johnson. I can tell him it will be between this and that, if that is what we are talking about. I would like to ask Mr. Philippe a question, and that is, on the basis of this information, which is certainly very fragmentary, when Dr. Buchanan was here, I got the impression from him that the problem might involve a good deal more than adding a couple or more inches to the amount of overlay that would have to be put on. I did not have the opportunity to obtain from him, timewise, any detail as to what that would involve. Is there anything that was in your mind oher than an additional 2 inches of overlay?

Mr. PHILIPPE. I do not think we agreed to or discussed any particular thickness. As a matter of fact, we discussed the test results in great detail, but they did not go on from there particularly. I cannot remember anything that was discussed that would lead to any such conclusion on my part, or Dr. Buchanan's part, at least according to our discussion.

Mr. RILEY. I understood from Mr. Porter that his figures involved digging out these places, doing the so-called dental work, and then putting on the 2-inch overlay; is that correct?

Mr. PORTER. That is correct.

Mr. RILEY. I do not see how we can get any better figure than we have.

Mr. HUGGINS. The thing that bothers me, Mr. Riley—admitting here that we are not experts, and goodness knows I am not—Dr. Buchanan did take a good round guess at $4,000,000. Our people in Morocco are concerned simply with whether 4 inches or 2 inches will do the trick. We do not know.

I suppose what I am asking is that I want to be shown, even though I am not from Missouri, so I will have some pretty good assurance before I say, "This is what the Air Force thinks it is going to cost," and ask you to provide money for it.

Mr. PHILIPPE. I was in on this $4,000,000 estimate. That was done when we were sitting around trying to get some idea of what these things are going to cost. We had no basis on which to estimate costs. The principal cost is the cost of asphaltic concrete, so we sat around and said, "What is a good figure?" And I think that we agreed that a good talking figure was the $1 per inch per square yard of area, and the $4,000,000 estimate came from just that sort of thinking. I do not think it is significant at all in comparison with the estimates that you

would expect from a contractor, or an architect-engineer. It was just a simple shotgun figure so that we could say in broad terms that it would cost $4,000,000.

Mr. RILEY. What would be a realistic figure, then, based upon your experience over there?

Mr. PHILIPPE. I do not think that there is any realistic figure based upon my experience because I have no cost experience in Morocco.

Mr. RILEY. General Walsh, do you have any figure?

General WALSH. Yes; I think the figure that the architect engineer used after consultation with Atlas Constructors, with the district engineer, and with my paving engineer, is a very realistic estimate of the cost. Those are the figures that General Pick used.

Mr. RILEY. Somewhat less than $1 per inch per square yard?

General WALSH. Yes.

General HARDIN. I would like to make it clear that there is a considerable difference between out-of-pocket costs, which is the basis of that estimate, and what might be a normal rule-of-thumb cost, which would include all the plant amortization charges and other things that I mentioned in general overhead and what-not which we did not feel were necessary to incorporate in this because those things are not influenced by this remedial work.

Mr. RILEY. In other words, you already had your set-up, you have your engineering, you already have the equipment and things of that kind, so that the actual out-of-pocket cost, you think, the figures given to us, are realistic?

General PICK. One reason that we use out-of-pocket costs, Mr. Chairman, is that if we try to distribute these small costs the administration would be more costly than the effort.

Mr. RILEY. Thank you. I think the committee understands that, and I want to pin down this $2,000,000 figure. Is that a realistic maximum figure, in your opinion, General Hardin, or are you prepared to say?

General HARDIN. Yes, I am satisfied, with all the information that is available to us, that I do not anticipate any more disturbing information than what we have had given to us. With all the time that went into it and the conferences that were held in arriving at it, I feel that it is a satisfactory estimate.

Mr. RILEY. General Walsh, do you agree with it?

General WALSH. I do.

Mr. RILEY. Mr. Porter?

Mr. PORTER. I do.

Mr. RILEY. Mr. Bonny, does anyone in your organization agree with it?

Mr. BONNY. We have already agreed.

Mr. RILEY. And that is the opinion of everybody who has made a thorough examination and investigation of it?

Mr. BONNY. Yes.

Mr. RILEY. I do not see how we can do much better than that.

Mr. HUGGINS. May I ask a question?

Mr. RILEY. Yes.

Mr. HUGGINS. I am under the impression, but I may be wrong, that that is the cost of the leveling course and the 2-inch overlay?

Mr. RILEY. And the dental work.

Mr. HUGGINS. That is just the question that I want to come to.

Mr. RILEY. As I understand it—and I want to be corrected if I am wrong because I do not want to have to tell the Congress that I did not understand what is going on—this is the compaction, the dental work, the leveling course, and the overlay?

General HARDIN. More than that. It also includes replacing unstable subgrade and base that may be required in this dental work operation—not just the surface.

Mr. HUGGINS. I just want to express a note of surprise here. These pavements, including preparation of the grade run $12 a square yard in the United States. Over there they run more than that. If we are talking 5 percent or 8 percent, then we are talking about something from 50,000 to 80,000 square yards, I believe. Now, is it possible to dig out, repair the subgrade and put in completely new pavements up to the point where you come to your level course and put on the 2-inch level course for the $723,000 figure?

General WALSH. I might be able to throw some light on that. The estimate of cost per square yard includes the following: The original stripping of the soil on the site——

Mr. RILEY. That is the overlay?

General WALSH. Yes; the topsoil, for a width in conection with the runway of 1,500 feet. It consists of grading, all-over grading of that full 1,500 feet of width. It consists of all the drainage that goes into providing for drainage of the entire runway. It consists of the compaction of the subgrade, the leveling in cut or fill that must be done in order to get the proper runway profile. Then on top of that, you add your base course and your surface paving. So that the $12 a yard includes a great many other items of very large magnitude over and above just the asphaltic paving and the base course that is under it.

Mr. HUGGINS. I think that is recognized. There is no question about that. I have not any idea what the proportions are.

Mr. RILEY. The point on which I wanted to get everybody's opinion is this—and if you want to change your mind, now is the time to do it. When I go to Congress and tell them that it is going to cost a maximum of $2 million to repair this job, I want to know that I am on firm ground.

General PICK. Mr. Chairman, I had not heard that $2 million figure. I thought the maximum figure that was developed by Mr. Porter and Mr. Philipp was $1,800,000.

(Discussion off the record.)

Mr. DAVIS. This morning we heard read a paraphrase of a letter from General Old, the Air Force officer on the spot at Sidi Slimane, in which he indicated that they had requested the discontinuance of some rolling tests that were being conducted there. My impression was that those rolling tests were conducted subsequent to the tests that Mr. Porter testified to and the Corps of Engineers testified to; and I wonder whether that information causes you to offer your opinion on the firmness of the dollar estimates that you gave us earlier today.

Mr. PORTER. No; I think I have as much data, and probably more, than we have been talking about here. I have a large sheaf of papers that were hand carried from overseas and given to me night before last. My comments on the maximum estimate took into con-

sideration the fact that the rolling program on the 4,000 feet of runway has not responded as much as we anticipated when the estimate was originally prepared and the additional cost was added in this discussion this morning to take care of an anticipated additional thickening.

I mentioned first that in the 4,000 feet of the runway that we had bad, 23 test holes are shown here, not to scale, but by circles scattered throughout the area. I think I also mentioned that of those 23 tests there was only 1 that contained an excessive amount of clay, and that was not exceedingly so.

The CBR tests consistently appeared to be entirely satisfactory for the present condition of moisture content. Some of the CBR's on the soaked base come up well above the 55 percent. There are a number of them that do not—that is, samples free from excessive clay—that show low values and are not responding. The only explanation I can see for this is that the gravel is loose and unbound and that further rolling will be necessary to fully consolidate those materials.

I did, however, take this data into account in my discussion which supplements the written report.

Mr. DAVIS. You are satisfied, Mr. Porter, that the specifications as planned were adequate for the runways at Nouasseur and Sidi Slimane, are you?

Mr. PORTER. For this repair program?

Mr. DAVIS. No, I am talking about the original specifications now.

Mr. PORTER. Yes, sir.

Mr. DAVIS. Are you also satisfied that this figure of $2 million that we have been using here is an outside figure for bringing both of those bases up to specifications?

Mr. PORTER. I do, sir, based on the out-of-pocket cost. Mr. Philippe mentioned that figure of $1 per square yard per inch. That is a rough figure we commonly use for work over there where you include all the overseas overhead for plant equipment, like on a new base, including setting up about a $1 million crushing and screening plants, and so forth. The discrepancy between the estimate and the $1 per square yard per inch may be fully accounted for by overseas operations and plant set-up which runs into quite a few millions of dollars.

Mr. DAVIS. You have already staked your professional reputation on agreement with this, have you not, General Pick?

General PICK. Sir?

Mr. DAVIS. You have already staked your professional reputation on agreement with this; have you not?

General PICK. Yes, sir. When I was over in north Africa, I had all the talent that you see here and some more, and I went over the test data very thoroughly before going over there. Then, after getting over there, I went out on the ground and I saw some of these depression areas. Assuming this table were a runway, they would roll that and then put levels on it and put chalk marks down to show the limits of it. I saw one of those opened up and the CBR test made on it. I was of the opinion there—as I believe most of these gentlemen who were there, Mr. Porter, Mr. Philippe, and all of them: General Hardin and General Walsh—that we were a little shy on moisture. I was satisfied that the estimate which was made—

we discussed it as being an estimate which quite necessarily would have to be extended some, but we did not attempt to try to say how much, because this was an estimate made upon technical data which had been so thoroughly investigated that the experts thought that they were on sound ground. That is the way Engineer estimates are made up, not only for pavement but for all other structural jobs. So, I believe I am thoroughly committed to this estimate, and I believe it will be found in the long run to be a very reasonable estimate at this stage of the game.

Mr. DAVIS. We have all the experts in agreement on it. The only people who are a little skeptical are the people who are going to have to use it, and I suppose the supreme test will come at that time.

Mr. HUGGINS. I suppose so.

General PICK. I think, Mr. Chairman, I would like to make it plain that I do not think there will be any trouble experienced with the operation of these runways during this rainy season. I believe that the rolling is all complete at Nouasseur on the runway, is it not, General?

General WALSH. All except the south half.

General PICK. You have got the sealing coat down on that?

General WALSH. No; only the 1-inch sealing surface on the refueling and the north warm-up area——

General PICK. That has been put down since we left there.

Mr. RILEY. I want to express my appreciation to Mr. Maxon and his group for coming here and testifying. You have been of considerable aid to us, Mr. Maxon.

Mr. Huggins, we appreciate your presence today. You have been most helpful.

Tomorrow morning the committee would like to have the PUSOM group, the Engineers, and the contractors for a couple of hours. I think we can then wind up this situation. I know we shall all be relieved if that can be done, and I see no reason why it cannot be.

Mr. HUGGINS. I think on the basis of all the professional reputations that have been staked out here—I have not as yet gotten in touch with Senator Johnson to release funds for this repair work—but I think on the basis of this data I shall write him and put a maximum figure of $2 million on it, if that is all right.

Mr. RILEY. I do not see how we can get any better testimony than we have gotten here this afternoon.

Mr. HUGGINS. Other than experience might show. I want to make clear, as far as the Air Force is concerned, we are not disagreeing; we just do not know.

Mr. RILEY. I am in the same position, and I think probably other members of the committee are, too. But I do not know where we can get any better information than we have obtained.

Mr. HUGGINS. I do not, either. As I say, we will rely on the Corps of Engineers, but we have not as yet had anything other than General Pick's initial report, which was not based on this same information.

Mr. ROWE. Mr. Chairman, I would like to make just one statement. That is, that the report that Mr. Huggins has is exactly what Mr. Porter anticipated would happen under the 200-ton roller. I think Mr. Porter made that clear when he was explaining his estimate. But certainly it was our understanding, in reviewing the test procedure

that had been set up, that exactly what had happened under the 200-ton roller at Sidi Slimane would develop. I do not know whether that had been made clear to Mr. Huggins and the chairman from the discussion here or not. But there is no mystery about the fact that these waves or irregular areas and slight depressions did develop in this 4,000 feet of runway when the tests were made with the 200-ton roller; and, in private discussion of this with Mr. Porter for about 30 seconds this morning, I understood that in his opinion it would not seriously interfere with Air operations. That seems to be contrary also to what Mr. Huggins has stated and I would like to have that point clarified by Mr. Porter.

Mr. HUGGINS. I think General Old is to pass on whether he wants to operate a heavily loaded bomber off the runway.

(Discussion off the record.)

Mr. RILEY. I think the committee is thoroughly conversant with the situation as far as the information is available, and certainly I do not know any better source to go to for information than we have had here today.

Again I want to thank you gentlemen for being here and helping us with this. We shall ask the PUSOM people, the Engineers, and the contractors to meet with us for a little while in the morning to wind this up.

Mr. HUGGINS. I might state that I just skimmed over Mr. Maxon's report last evening. I have not yet had a chance to study it. I think the Air Force feeling is that the job is now pretty much along the lines that Mr. Maxon indicated, and is moving along.

Mr. RILEY. If you would like to have somebody representing the Air Force here tomorrow, we will be very happy to have him, Mr. Huggins. The committee will meet at 10 o'clock in the morning.

SATURDAY, SEPTEMBER 20, 1952.

Mr. RILEY. The committee will please come to order. We will ask Mr. Donnelly to proceed with the inquiry.

Mr. DONNELLY. Rather than repeat the list of witnesses at the outset of the record for today's session, may the record show that Mr. Huggins, the Assistant Secretary of the Air Force, is not here, but the Air Force is represented by Mr. John P. H. Perry, Deputy for Installations; and let the record show that the Maxon group was excused by the committee from further attendance. All the other witnesses who were here yesterday are here today.

Mr. Chairman, there appear to be two major areas left for consideration before this record is terminated. One is the very confused question of what are specifications, and were they complied with or were there deviations therefrom? The second is the closing statements on behalf of anyone who desires to be heard on any matter, including in particular response or explanation to the statements made by General Lovett in his letter of December 27, 1951, to General Pick.

BACKGROUND OF INITIATION AND DEVELOPMENT OF MOROCCAN PROJECTS

In order to understand the specification problem and to put that in its proper perspective, I should like to ask General Pick to start

with the Air Force directive to the Corps of Engineers with respect to initiation of construction of this job, and to indicate what urgency he was advised existed with respect to this construction, the nature of the instructions that he gave to the contractor and the architect-engineer with respect to urgency, the way the job was contracted for, the way it picked up speed, the way it developed, and the way the performance was executed.

Would you do that, General?

General PICK. Yes, sir. Mr. Chairman, the records will show that in the latter part of 1950 the Chief of Engineers received directives and letters which beyond a doubt indicated that the Air Force desired to rebuild four air bases in north Africa and to build a new air base in north Africa, and that they should be ready by the 1st of July 1951. That came at a time when another very famous directive was received for the building of an air base in northern Greenland.

Our discussions with the Air Force indicated that these facilities in north Africa were needed very badly. There was a considerable amount of confusion in the country at the time. Things were not going so well in Korea. Our Army was being pushed back. Not only my office but the people in the field who were concerned with the building of the air bases in north Africa had it impressed upon them from day to day by all echelons of the Air Force that these bases were vital in the defense of our country. Every indication showed a great urgency for us to move.

In the latter part of December we began to organize for carrying out the work. Contractors were selected. Architect-engineers were selected. Offices were set up in New York. Advance people were sent to north Africa to look over the situation. The preliminary reports for the rebuilding of the four air bases and the building of another were being studied carefully to determine what was necessary and what would be needed to carry out these projects. We knew what the problem was. We knew some of the obstacles that would be encountered. We had to plan to overcome them. We had to start procurement immediately, almost.

By the first of the year of 1951 we had selected the contractors and we were getting down to the point of working up lists of material and lists of equipment and starting procurement.

Now I should like, Mr. Chair, to emphasize that at that time when we were starting in the procurement we had a preliminary field report as to what the job was. We had made a preliminary investigation on the ground in connection with the Air Force as to the work to be done at the four bases that were to be enlarged, where we would get the materials, and what materials would be used to go in those, and also the same information for the new base which was to be built.

For instance, we knew the aggregate which was to be used at each one of these places. Based upon that information we started into procurement. One of the things that we ran into immediately was the difficulty in placing firm orders for procurement especially of construction equipment. It was learned early in January that the normal equipment, quarry equipment that we would need in the quarries over there, could not be procured in time to get the equipment part and have it moved to Africa. The information which we had on the soils at these various bases was very meager. The information on the

quality of the aggregates and the quantities of the aggregates, if you please, was very meager. For instance, we had not been able to develop the extent of the quarries which we thought we would use. We had not been able to make soil analyses of these various and sundry areas to determine how best to use the soil and the aggregate.

Early in January a very important decision had to be made based upon procurement. The contractor came and said to the district engineer:

I cannot procure this particular equipment, this quarry equipment, in connection with the screening equipment, because I cannot get delivery in time.

A decision had to be made then as to whether or not it would be possible to do something else. A meeting was held and it was decided that they would procure the equipment which they could get and get delivery on. That, Mr. Chairman, resulted in getting equipment which would not produce the aggregates necessary to live up to a specification that would be prepared for such a job in the United States where we had time and where we had an opportunity to get the necessary equipment.

That procurement went forward. The material was bought and moved to north Africa. The organization was gotten together and moved to north Africa.

Somewhere along in the early part of the spring it was determined that the four bases which were to be enlarged would not be enlarged, but that new sites would be selected; and that the base which was to be a new base would have a new site selected for that, which provided new soils to deal with and provided new aggregate problems.

General Hardin checks me up, sir, and says that the location of Nouasseur was not changed. It may not have been changed much, but I believe the records will show that it was not put in the same location. But if it is I stand corrected.

Mr. RILEY. Let me ask you one question right there, please, sir. If you had extended four existing bases could you or could you not have formed a better opinion from a visual inspection of the soils and all, because there were certain installations in place at those bases? Could you not have formed a better opinion from a visual inspection there than you could in a brand new base where it had never been done?

General PICK. Yes, sir. There were people here who had first-hand information on the aggregates and on the soil conditions there. As I said when I started out, the preliminary report on this was all that they had to go on to start the procurement.

Now, the point that I wanted to make, sir, was that whatever was procured was procured for the work as we understood it when we went into the procurement. That was the enlarging of these four bases and the building of this new base at Nouasseur, which was in the general vicinity of where it is now.

In the early part of the spring we found out that those sites could not be worked upon, but new sites were located which gave new problems in aggregates and soils.

Mr. RILEY. Did you have time to test those soils and those aggregates in the usual approved manner?

General PICK. I have no information to show that very much time was allowed or was available for going into a thorough analysis of

the soils. As soon as they could find these bases, in other words, and they could be approved, I believe that Colonel Derby, who was over there as the district engineer, can say that as soon as they found one of these sites among the many that were investigated, and could get the Air Force and French to decide this was where to move, they rushed in there to start work as rapidly as possible.

EFFECT OF PROCUREMENT ON SPECIFICATIONS IN EARLY STAGES OF PROJECT

Now, Mr. Chairman, I have tried to point out that the specifications for these jobs were started, and the preparation of the specifications for these jobs started in the early procurement stage of these developments, and that the procurement had to a considerable extent limited the specifications.

Mr. RILEY. In other words, if I understand it correctly, certain supplementary or revised specifications were made which were outside the book, so to speak, is that right? They had to be made on account of the existing situation?

General PICK. Yes. Decisions had to be made which would limit the specifications, I would say. That was knowingly so, sir, because at that time it was decided that you could not get the screening equipment and get it over there in time to do the job by the 1st of July.

Mr. RILEY. The committee is interested in knowing just what those new or supplementary specifications, or specifications outside of the Engineers' Manual, were. If those were adopted as specifications, then those were the specifications. We would like to know what they were and how they differed from the usual and regular specifications in the normal construction work.

General PICK. Mr. Chairman, I should like to be allowed to develop the subject a little further.

Mr. RILEY. Yes.

General PICK. Then we want to give you the details.

Mr. RILEY. All right, sir.

General PICK. As to the preparation of the specifications.

I have shown you that there was a limit on the equipment that could be procured, and knowingly so. The district engineer and the contractor knew that certain equipment which they would want over there could not be procured.

I have shown you that they went over to do one job and that they were never allowed to work on that job, but they worked on a new one.

EFFECT OF AVAILABILITY OF MATERIALS ON SPECIFICATIONS

I will take you a little further along to Sidi Slimane, if you please, sir, and show you that decisions had to be made there because of the urgency of the situation and the lateness of the starting to work at these new sites. A decision was reached after a discussion between the contractor and the architect-engineer and the district engineer that the best source of aggregates could not be used, primarily because of the time element at Sidi Slimane, because the distance, as was testified to here yesterday, was too great. The quarry was some 18 miles from the scene of the work, and it would necessitate building haul roads or would necessitate using haul roads and railroads, or the railroad alone, and there was a question of proper railroad equipment for hauling

rock, which was not available. There was the extra work of building a road, and then hauling that aggregate for that distance of about 18 miles. That was such as to not allow you to process the aggregate, move it to the site, and get it there in time to get the work done which was needed.

Therefore another decision had to be made which had a vital effect on the specifications as they would be finally prepared, and that is that you had to select another source of aggregate for this job. It was done knowingly, knowing that that created many problems in soil mechanics and in the construction of this pavement. It also affected, to a great extent, the final specifications that would be adopted.

In other words, Mr. Chairman, you started to build specifications back in January. I think we will be able to show here both at Sidi Slimane and at Nouasseur those specification were never completed until you had gotten along into the job and it was well going, and even not until the job was well toward finishing of the first year's work, until you could see that they had the general specifications.

Mr. Chairman, I testified to that effect before this committee and before the Senate committee, and I made the statement that I thought the specifications which were finally worked out there in general were carried out. I believe that I was correct in that statement, and I believe we can show now how those specifications were really worked out from time to time long before the job started and even after the job was under way.

I should like to ask General Hardin if he will develop the subject further, with the assistance of Mr. Porter, Colonel Derby, and General Walsh.

DISCUSSION OF SPECIFICATIONS FOR MOROCCAN BASES

Mr. DONNELLY. General Hardin, in developing this subject the chairman of the committee specifically wants to obtain an understanding of the nature of the specifications, in order to be in a position to determine whether there was compliance with them or deviation from them; so would you keep that in mind as you make your statement, sir?

General HARDIN. Mr. Chairman, I should like to start out by making a general comment not particularly applicable to this job but to any job for which the Corps of Engineers has the responsibility for direction. There has been confusion in the minds of a good many people as to what the specifications truly were, and what they stem from in any particular job which we supervise in the Corps of Engineer organization, be it at a district or division. The Corps of Engineers utilizes certain basic technical guides in the undertakng of specific work. These general guides in the first instance are known as the Engineering Manual for Military Construction, which is published in many parts and chapters by the Office, Chief of Engineers. The one particularly pertinent to this operation is called part 12, chapter 2, Airfield Pavement Design, Flexible Pavements. That is a technical compilation which sets forth the whole theory of design of flexible pavements.

I should also like to add that this theory of design was one which is developed largely from the adaptation of highway practice of past

years in bringing it up to standards which are required to meet the extreme demands of heavy aircraft, which impose loads many, many times greater than the highway traffic. The adaptation of the highway design to the construction of pavements of great supporting power is largely one of trial and test. You might refer to it properly as an empirical design procedure. Assumptions are made and then tested by building the surface and destroying it by applying extreme traffic tests to that surface. You actually run loads over it for a long period of time. We call those trafficability tests. They are also referred to as accelerated traffic tests.

The outcome of those accelerated traffic tests and the observation of the pavement after they are through results in the preparation of certain curves which can be applied readily by the field engineer in setting up the total thickness of the base course and asphaltic pavement to meet the requirements of the particular aircraft that you are designing for.

In addition to the total thickness of the pavement which is set forth in this manual, there is in a section of this particular chapter information on the desirable gradation limits for different sized stone or materials other than crushed stones for building these high quality pavements. They are presented in this manual in the form of two curves, which set the upper and lower desirable limits of gradation. They are frequently referred to as the permissible envelope for the gradation of materials that will be used in the standard pavement design.

There are also in this manual basic policies for procedure in construction, such as the matter of placement, the thickness of placing courses, and so forth. It is improper to refer to this manual, in my estimation, as a specification, because it is more closely comparable to a textbook.

In addition to the manual there is another basic paper, or a series of them, used by the Office of the Chief of Engineers, and it has had its place in the discussion before this and other committees, but I think some clarification about these particular papers is necessary to avoid confusion. These additional papers are called Guide Specifications, and they cover a variety of undertakings. The one particularly pertinent to this project is called Guide Specification for War Department Construction, Office of the Chief of Engineers. Pavement, Flexible, Select-Material, Base Course.

This guide specification does not attempt to define the exact procedures that will be utilized on any one job. It is merely an outline, and it has paragraphs in it to suggest to the engineer the things which he should include in the preparation of the detailed specifications. It is a skeleton, in other words, for the engineer to use in building the job specifications. We find by means of this document that we have uniformity, that we avoid omissions, and that our specifications are built around the elements of the usual problem, so that the contractor and the people in the field are guided in the preparation of the specifications, and so that they will be adequate when they are prepared in this fashion.

Those things were, of course, in the hands of the district engineer, and are standard reference sources.

Now, the building of the job specifications. I will at a later time read you, I think, a pertinent paper which will elaborate somewhat on

General Pick's statement that the specifications in truth begin with the commitments that were made in January for the procurement of the crushing equipment and, as a matter of fact, the equipment for the bituminous pavement.

Mr. DONNELLY. General Hardin, may I interrupt you there. There is testimony in the record from the Air Force to the following effect by Mr. Perry:

> I was startled by the testimony before your committee, I think, and the Lyndon Johnson committee, that there were no specifications. That is a lot of rot to me. Certainly that is a strong word, but I use it advisedly. Certainly there is a manual on construction which the Engineers use. These fellows all knew what good construction was. The specifications may not have been on paper, but this alibi that "We did this without specifications" does not set with me at all.

Would you have that in mind as you develop that here?

General HARDIN. Yes, sir. I think I have answered it in part, and I am confirming the fact that there was in existence the textbook and the outline of the specifications available to the district personnel when this job was initiated. That was available to all concerned.

DEVELOPMENT OF BASE COURSE SPECIFICATIONS FOR MOROCCAN BASES

In order to keep this discussion from getting into too many ramifications, I have selected the base course specification as the one to develop, the other elements of the specifications being, I think, generally similar.

A letter was written by the district engineer on the 5th of April, subject: Responsibility for Air Base Construction. It was addressed to the Atlas Constructors and Porter, Urquhart Associates. This was before construction was begun at either Nouasseur or Sidi Slimane. It reads as follows:

> CORPS OF ENGINEERS, UNITED STATES ARMY.
> *Bureau du Port, Quai Leon Petit, April 5, 1951.*
>
> Subject: Responsibility for air base construction.
> To: Atlas Constructors and Porter-Urquhart, Associated.
>
> 1. With reference to letter No. CE-16 dated March 30, 1951, from Porter-Urquhart, Associated, following is a general statement of the policy of this headquarters with regard to the functions of this headquarters, the architect-engineer contractor, and the construction contractor, concerning the design, construction, and development of the air-bases program in Morocco.
>
> 2. The Chief of Engineers, United States Army, and under him the district engineer, East Atlantic district, is responsible for proper design and construction of the bases. In order to obtain the best possible engineering design talent, the district engineer has employed an architect-engineer who has the following responsibilities:
>
> *(a)* To carry out the necessary reconnaissance, inspection, and design calculations to produce complete and adequate airfield facilities at each of the base sites.
>
> *(b)* To prepare for the approval of the district engineer the design criteria and specifications for all construction phases of the work.
>
> *(c)* To carry out the detailed acceptance inspection of the construction as it progresses and to insure that the approved specifications are met by the construction contractor.
>
> *(d)* To coordinate all phases of its reconnaissance and design responsibilities with the district engineer and the construction contractor, and to keep both informed of the progress of its work.
>
> 3. In order to have the best possible talent on hand to carry out the construction, the district engineer has employed a construction contractor, who, together with such local subcontractors as he may select and obtain approval for from the

district engineer, carries out the construction program of the air bases. The construction contractor has the following responsibilities:

(*a*) To carry out all stages of the construction of the several bases.

(*b*) To exercise its good engineering experience to recommend to the district engineer any revision of design plans, site locations, or other features of the work which, based on its experience, do not appear entirely practical.

(*c*) To keep the district engineer and the architect-engineer informed at all times of its operations and the progress of its work.

4. The district engineer and his staff have the following responsibilities:

(*a*) To review, supervise, and approve the activities of the architect-engineer and the construction contractor.

(*b*) To furnish to the architect-engineer and the construction contractor such basic design and construction criteria as are specified by United States Army and Air Force regulations.

(*c*) To review for acceptance the design plans of the architect-engineer.

(*d*) To review for acceptance the facilities constructed by the construction contractor.

(*e*) To review, arbitrate, and settle any misunderstandings which may arise between the construction contractor and the architect-engineer as a part of the construction program.

5. It is the further policy of the headquarters that the East Atlantic district and its architect-engineer contractor constitute primarily a staff of design, supervisory, and inspection personnel whose prime purpose is to facilitate and expedite the construction operations of the construction contractor. In this sense they function in the same capacity as a military staff section for a combat organization.

6. The responsibilities and duties of the district headquarters, the architect-engineer, and the construction contractor are, in general, to delegate to their resident engineer at each site the same responsibilities and duties within the scope of each project as outlined above, with the district resident engineer as final local supervisor and arbitrator.

For and in the absence of the district engineer:

L. L. HASEMAN,
Lieutenant Colonel, Corps of Engineers,
Deputy District Engineer.

That, I think, can be accepted as the basic understanding of the three echelons engaged in this project of their mutual responsibilities. I do not believe there were any modifications of that concept during the early phases of this operation; I mean early phases so far as my personal knowledge goes, until the latter part of 1951.

Now, to get back to the subject of procurement of equipment for a moment, that vital step of procuring equipment was undertaken without the participation of the architect-engineer. He had not been selected at that time, or if he had been selected he was not notified of the actual acceptance of his services. There may have been negotiations, but the record clearly indicates that the architect-engineer was not active at the time the determination was made for the selection of equipment, and procurement was undertaken.

In April 1951, April 2, the district engineer received from Porter-Urquhart a letter on the tentative base course grading specifications. It read:

APRIL 2, 1951.

Re: Tentative base course grading specifications.

DISTRICT ENGINEER,
East Atlantic District,
Corps of Engineers, United States Army,
Rabat, Morocco.

DEAR SIR: In order that you may acquaint the local rock producers with the type of grading we will require in our crushed-rock base courses we are submitting herewith, a tentative base-course specification.

Crusher-run base

Sieve size	*Percent passing*
2½ inch	100
2 inch	90–100
¾ inch	50–80
No. 4	25–50
No. 30	10–30
200	3–11

With the proper rock source the above specification will make a highly stable base course with CBR bearing values well in excess of 100. Local rock source and processing eqiupment may affect this grading specification in certain airfield sites. In these cases CBR evaluations will be made to assure adequate stability in the base course.

Yours very truly,

PORTER-URQUHART, ASSOCIATED,
O. J. PORTER & CO.,
A. J. WILSON, *General Manager.*

Upon receipt of that communication, our district engineer wrote a letter on April 3, and in the final paragraph said:

It is requested that you advise immediately if you expect any difficulty in producing rock to meet these specifications with the equipment now available or being shipped from the United States.

Upon receipt of that paper, the Atlas Constructors, on April 11, responded to the district engineer as follows:

ATLAS CONSTRUCTORS,
April 11, 1951.

Subject: Base Course Specifications.

DISTRICT ENGINEER,
Advance Echelon, East Atlantic District,
Bureau du Port, Quai Leon Petit,
Rabat, Morocco.

DEAR SIR: Your letter of April 3, 1951, submitted tentative specifications for graduation and quality of crushed rock-base course has been noted.

It will be physically impossible for us to produce base course meeting these gradation specifications. The specifications submitted by your office are nominally for 2½-inch stone. Actually the stone would have to be crushed to about 1¼-inches in order to make the large percentage passing ¾ inch and smaller. To make this gradation of rock would require a large number of very complete plants with flexible provisions for screening and recirculating.

When this work was originally discussed, Atlas Constructors were informed that 3½-inch unscreened crushed-run material would be used for the base course. At that time we were not informed that any appreciable amount of gravel would be available at any one of the sites. As a consequence, this contractor bought sufficient equipment to produce 3½-inch base-course material from suitable country rock adjacent or nearly adjacent to the sites. To accomplish this objective we purchased 15 straight-line crushing plants with no provision for screening or recirculation of the material; each plant to be composed of two crushers with the secondary crushers set at a maximum 3-inch opening so that approximately 85 percent of the product would be minus 3 inches and practically 100 percent minus 3½ inches. The equipment necessary to accomplish this result was placed on order in the United States by January 15, 1951. A portion of the purchased crushing equipment and all necessary materials for our present needs is available at the Casez staging area. The balance of the purchased crushing equipment is either en route or at the terminal in New York. The equipment market in the United States is such that if it were necessary to revamp the crushing and screening operation, we could anticipate a delay from 120 to 150 days, in receiving the equipment at the site of the work. As a consequence of the above, we recommended that the specifications for the base course be redrawn to conform to the original instructions given this contractor—i. e., 3½-inch crusher-run material. If necessary, additional fines from local sources, if available, may be added to secure the necessary compaction.

To summarize, we have neither on hand or on order the type of crushing equipment necessary to reduce any of the material at Honasseur or at any of the other quarrying locations, to the size required in the recent specifications; nor have we the screens and conveyors necessary for recirculation.

We request an early review of this problem and a directive instructing us to proceed with the manufacture of base course in sizes and in grading compatible with the equipment we have on hand and on order.

N. D. TETERS,
Construction Manager.

Following that, there was a meeting on April 21, and I will not go into that since it is a repetition of the letter I have just read, except that I can see that the problem was a most serious one for all concerned, and they were endeavoring to find a practical solution to the problem. At that meeting were representatives of the district engineer, the architect-engineer, and the Atlas Constructors, with numerous officials in all those organizations being present.

Mr. DONNELLY. What date are we up to now, General?

General HARDIN. That was April 21.

Mr. DONNELLY. That tentative specification that you read, as I remember, was dated April 3, 1951?

General HARDIN. That is correct.

Mr. DONNELLY. As of that date, had the sites at Nonasseur and Sidi Slimane been definitely decided upon?

General HARDIN. I think they had been decided upon.

Mr. DONNELLY. Was the availability of the aggregates known at the time that was drawn?

General HARDIN. I do not have knowledge of that.

Colonel DERBY. It was known at the beginning of April at Nouasseur. At Sidi Slimane, reconnaissances were still under way of suitable materials at that time. There had been considerable discussion of using what they called soil cement. No decision had been reached early in April as to just how the job would be carried out.

Mr. DONNELLY. The chairman points out that construction was initiated at Nouasseur on April 22, the day after this meeting on April 21. At that meeting on April 21, was the nature and the scope and the requirements of the specification finally decided upon?

General HARDIN. I wouldn't say that there was a final decision on the matter. The problem was made known to all, and apparently there was further effort to be made in determining what might be done with the equipment that was available, which would permit the aggregates that were available to be processed to the degree of gradation which would fall within the generally conceived proper envelope of gradation that we desired for high-quality pavements.

In this meeting they discussed the possibility of local contractors being explored so that their equipment in Morocco might be utilized. The problem was not resolved at this meeting. I see such things as, "Atlas will determine capacity of local contractors to develop fines suitable"; and that "fines when so added should produce a properly graded mix"; and that "prices for such rock will be such as to guarantee delivery to Atlas at the rate needed."

Mr. RILEY. General Hardin, do you have any correspondence there that indicates just when a decision was reached as to the aggregates that were to be used?

General HARDIN. The specifications which came out as a result of this meeting were finally approved on May 30. In the meantime, the

operational work had gone on on a tentative basis, with a memorandum of understanding, and so forth, as the basis for the conduct of the work. The work started on the 22d of April, but that doesn't mean they started placing base rock on that date.

Mr. RILEY. You had to do some excavation and fine grading first?

General HARDIN. Yes.

Mr. RILEY. But would your information indicate that the rock base was started before the final specifications were agreed upon?

General HARDIN. Yes, sir. That is, the specifications in final published form were not available when some rock was being placed.

Mr. RILEY. But there was some verbal understanding before that?

General HARDIN. Yes, sir. I think there is every evidence that there was a verbal understanding and that the three parties concerned were in agreement on the procedures being used, but it was in a fluid state, and there were modifications at rather frequent intervals that were adopted up to the time the specifications were published.

Mr. RILEY. Do I understand that the rock that was placed there was tested from time to time to see whether it was holding up in the manner in which you expected or hoped it would hold up?

General HARDIN. There were tests made. From the inspector's records I would say definitely there were tests made of the rock. In fact, they placed some in test strips, and they would verify its ability to meet the specifications that had been tentatively adopted, and also the bearing values of the material placed in that fashion. That is the procedure we normally go through before we build a job. The building of test areas is generally cleared and completely satisfied before we begin work, but in this case it had to run on concurrently.

Mr. RILEY. Was it the expectation of the engineers, or contractors, do you know, to rip out any of this work which did not meet the bearing test which had to be met?

General HARDIN. Yes, sir. There were various instances where work was rescarified, which means plowing it up and putting more moisture in it and recompacting it. I think the records are rather full of such evidence as that, trying to improve the construction techniques to get a better result.

Mr. RILEY. In other words, just because it was in place, you didn't leave it there when it didn't meet the bearing test which you thought it should meet?

General HARDIN. While we were developing the bearing test or test areas, I am not in a position to discuss that. I think Mr. Porter had better do that. All I have that is available to me is a variety of records from which I tried to get a good viewpoint to express to you as to what the problems were in arriving at this word "specification" which has been so tortured.

Mr. RILEY. I would like Mr. Porter to give us his version of that now.

Mr. PORTER. I would like first to concur in what General Pick said about the specifications. The specifications were tentative. I think the specifications were a matter of joint conferences right through all of April, and most of May, and were decided on at Nouasseur, by mutual agreement of all parties concerned, on May 21 or 22, as they were prepared to start base construction. Naturally, it was a few days later, May 30, before the specifications, as decided upon, were published.

During that time and immediately preceding that, the first portion of the rock plant had been started in operation and some of the base material spread on 100 feet or so of the runway, to determine whether they could bind it up tightly and get it level, and it was found that the production could be accomplished by using the 3½- or 3-inch material to lay the lower portion of the base, and then finishing it off with a leveling course on the top in order to be able to shape the base to proper grade and slope.

Mr. RILEY. Was that a smaller aggregate that was on top?

Mr. PORTER. Yes; it was decided to use a smaller-sized aggregate on top for a few inches in order to shape the base to proper grade and slope to allow the pavement to drain.

Mr. RILEY. How did you get the aggregate for the upper portion?

Mr. PORTER. That had to be done by closing one line of crushers down, and at the time it was contemplated by the contractors that they would put in another stage in some of the lines in order to produce a smaller material. Until that was down, they considered, when necessary, using portable plants to recrush the material to a smaller size.

Mr. RILEY. Did the tests during this period get the anticipated results at Nouasseur?

Mr. PORTER. Yes, sir.

Mr. RILEY. Was it necessary to rip up any of the work of the base course during this test period?

Mr. PORTER. No, sir. In a test operation, of course, you try to see how you can lay it in 4- or 6- or 8-inch layers and consolidate it, and if a strip 8 inches thick was not right, the routine procedure is to blade the material over so that you can compact one layer and put the other layer on top. It was found that you could process this large 3½-inch rock in all lower layers, and put it together, and then smooth up the top with some finer crushed rock.

Mr. RILEY. That construction at Nouasseur has been generally satisfactory with the proposed compaction which is either now in process or which will soon be in process?

Mr. PORTER. Yes, sir.

Mr. RILEY. Thank you, sir. General Hardin.

General HARDIN. The matter was a fluid one, subject to successive adjustments. I have a memorandum of June 2, which reads as follows:

MEMORANDUM FOR THE RECORD

JUNE 2, 1951.

1. A conference was held with Colonel Derby at 11 a. m., this date, to discuss the crushed-stone base requirements at the Nouasseur base.

2. Personnel attending were as follows: District engineering office—Lieutenant Colonel Haseman and Mr. Coy. Porter-Urquhart, Skidmore, Owings & Merrill, Associated—Messrs. Severinghouse, Porel, and Rich. Atlas Construction Co.—Messrs. Borman, Teeters, and Lusk.

3. The purpose of this conference was to discuss the grading requirements and methods of construction for the crushed stone base. Atlas personnel expressed their concern over the hardness of the rock, methods of placing in 6-inch layers and crushing the material to the smaller sizes. In a previous conference between PUSOM and Atlas it was agreed to use a 3½-inch maximum size crushed stone for a maximum of 6-inch depth in the lower course and with 1½-inch maximum size of 3-inch depth for the top course. Inasmuch as Atlas had not placed any of the stone base course, it was agreed to try placing the stone base course in 1 or 2 layers, using the 3½-inch maximum size stone. The depth of layer that can be

placed is dependent upon acquiring the maximum compaction and obtaining the required finish for placing the hot mix asphaltic concrete.

The results of the test will be reported as soon as the test section is processed.

L. S. COY,
Acting Chief, Engineering and Operations Division.

To indicate that they were having similar troubles at Sidi Slimane about the same time, I have a memorandum for the record dated June 6, which reads:

JUNE 6, 1951.

MEMO FOR THE RECORD

1. In company with Messrs. Gill and Lyman, C of E; Waller and Love, Atlas Constructors; and Griffin and Simmonds, Porter-Urquhart, Skidmore, Owings and Merrill, Associated, an inspection of the base course operation at Sidi Slimane was made this P. M.

2. Atlas has placed gravel for the base course as follows: over a width of 37½ feet south of and adjoining the center of runway: Sta. 14+00 to 17+75, 7" loose depth, crushed Sta. 17+75 to 20+00, 9" loose depth, pit run Sta. 20+00 to west end, 7" loose depth, crushed.

3. At present only 3 portable crushing plants are in operation and production is very low. The entire capacity of this set-up is not sufficient to meet base course requirements and no aggregate can be produced for asphalt paving. It is expected that the asphalt plant will be ready to operate by 15 June and the first of the 3 large crushing plants will not be ready for operation in less than 1 week.

4. In order to expedite progress and have some completed base course and a supply of aggregate on hand when the asphalt plant is ready for operation, it was agreed that over a strip 37½' wide, south of and adjacent to that on which gravel has been placed and approximately 2,000 ft. long westward from Sta. 14+00, pit run gravel would be placed to a depth of 9" loose measure. After compaction this will be followed by a second course of crushed gravel to make a total compacted thickness of 2 inches for the base course on this trial strip. The strip on which crushed gravel was used in the first layer will be completed to a total compacted thickness of 9 inches as originally contemplated.

5. If the bearing capacity of the strip on which pit run gravel was used is proved to be satisfactory by field tests the use of pit run gravel in the bottom layer of the base course will be authorized until such time as adequate crushing plant is in operation.

6. The completion of the crushing plant is to be expedited.

Dist:
Atlas (2)
Porter-Urquhart (2)

L. S. COY.

That was on June 6, as I pointed out, and another conference of a similar nature was held on Sidi Slimane on June 11, indicating further refinement and development of what was practical under the circumstances.

I do not want to take the time to read this one to the committee unless you desire it.

Mr. RILEY. In other words, there were frequent conferences all through this as to the results that were being obtained.

General HARDIN. Yes, and developing what was practicable to do.

Mr. RILEY. At Sidi Slimane where you used gravel, Mr. Porter, did you crush some of that gravel for the top course?

Mr. PORTER. Yes; there were specifications adopted which included the use of pit-run gravel in the lower portion and crushed gravel in the upper portion in order to get the job done on time.

Mr. RILEY. Now, the pit-run gravel in the lower course, was it not possible by visual inspection to see whether or not there was too much clay there?

Mr. PORTER. That was the intention and the performance came out close to expectations. Our studies indicate that the lower base or subbase course of pit-run gravel, in the work constructed in 1951, is in general adequate to carry the loads which will come upon it at this lower foundation level.

DISCUSSION OF EXCESSIVE CLAY CONTENT OF PIT-RUN GRAVEL

Mr. RILEY. We have had considerable testimony here about the excessive clay content.

General HARDIN. I would like to comment on that.

Mr. RILEY. Just one second. The question that comes to my mind is, even if the inspector at the quarry missed catching an excessive clay content, it could have been caught after it was laid by inspection of the lower-base course.

General HARDIN. I think there is a chance for that, Mr. Chairman, and I believe the detailed records of inspection indicate that that was determined to be the case at times, and that was the result of the incident that you had yesterday in the hearing of Mr. Simmons' objection to certain excess in clay content in the surface of the base. But I think it must be borne in mind that the crushing plants that served the asphalt plant were also not completely equipped with all the desirable screening equipment which would make it possible to have a degree of selectivity in this crushed material that was being specified and had been agreed upon for the top course of the base.

When you put the gravel into crusher equipment as it comes out of the pit, if there are lenses in the material that were excavated from the pit, that same material of clay that was in the lenses is going into the crusher, and unless you have some equipment, such as screening equipment, which will allow that undesirable material to be discarded, you are going to get that undesirable clay into your material which you haul out on the runway, and a visual examination of it is a very difficult process.

Mr. RILEY. You were talking about the upper crushed gravel?

General HARDIN. Yes.

Mr. RILEY. I can readily see where it would be difficult by visual inspection to see whether it was clay, or whether it was fine particles of crushed rock.

General HARDIN. That is very true.

Mr. PHILIPPE. This is a mixture of material that we are dealing with, and we are trying to judge how much clay there is in the mixture, and we say greater than 6 percent is not acceptable; less than 6 percent of this clay type of material is acceptable. It is a hard thing to determine visually.

General HARDIN. It is practically impossible.

Mr. RILEY. You did not have the equipment to make the inspection mechanically?

Mr. PHILIPPE. That is it exactly.

Mr. RILEY. I think that clears up the committee's mind in some respects, because certainly I had the idea that you could walk along and look at it and see whether there was clay in that rock, but I can readily see from this explanation this morning it would be almost impossible to tell the percentage of content in this crushed gravel.

General HARDIN. By visual inspection that is quite true.

Mr. RILEY. It would have to be mechanical grading and sifting.

General HARDIN. You might have a suspicion by looking at it with your eye and then confirm it by tests, but the tremendous volume of the material that was moving in trucks and moving at such rapid rates out to the placing area, day as well as night, made the exact inspection of this material, I think, extremely difficult.

PROCUREMENT OF ADDITIONAL EQUIPMENT WHEN FOUND TO BE NEEDED

Mr. RILEY. In connection with that, when you found that additional equipment was needed, was that promptly ordered by the contractors—after this so-called emergency or crash program was started, and you found from actual experience that you were not getting the results that you wanted?

General HARDIN. Yes; the need for additional crushing equipment and screening equipment was all developed as a result of the problems they had encountered in the early phase, and it was not possible to get that equipment over there for the balance of the construction season in 1951, but orders were placed for it, and it was delivered in time to be incorporated in some latter parts of the 1951 season, as I recall the record, but most of it was obtained for utilization in the 1952 program. It was complete before construction was proceeded with in 1952.

Mr. RILEY. In other words, after you had found by actual experience that additional equipment was needed, it was too late to get it for these two emergency strips, and they were completed before that equipment was ever available; is that correct?

General HARDIN. In general, I would say that is correct. There has been some indication that additional equipment was available and it was not installed in the asphalt plant. I have forgotten at which place. I think that it was at Sidi Slimane.

Colonel DERBY. There were some screens over there that had been lost. As soon as we found them we put them in.

General HARDIN. Some screens were available on the site that were not installed until the latter part of 1951. They had not been installed in the initial operation in 1951 at Nouasseur.

Mr. PHILIPPE. May I emphasize this point of the importance of this equipment: This equipment we are talking about was selected along about Christmas of 1950 by the five companies represented in Atlas and the district engineers. It was selected on the information that there would be quarries available probably at each one of the sites and that the quality of the rock was of a very general type that, generally speaking, is unknown, and that the equipment itself was placed under order in the period between the 8th and 15th of January 1951, and by that action the die was cast. There was no alternative.

I would like to take just a moment to show the contrast between that procedure, which was made necessary by time limitations and allocation, with our normal procedure. We reversed it completely. In other words, at most of our locations we have a great deal of knowledge about the materials, the quarries, the locations at which we must work—in the United States particularly. In the second place, we do a lot of exploration work, drilling and sampling of existing quarries and things of that sort. We take these materials into the laboratory and test them. We build test fills on the location and roll them out. We do all these things and then we write the specifications, and

then after the specifications have been written we select the equipment, or normally the contractor selects the equipment with all this background of knowledge.

In Morocco the complete reverse was true. We selected the equipment first and then the die was cast. There was no alternative. If you trace it back, all the troubles that we are having about specifications is because the expediency of the situation demanded that we purchase the equipment first, and that there was really nothing much to do about it once we had the equipment there.

General HARDIN. I would like to add this concept, which of course to a military man is inherent in your approach to a problem: You might say, "Well, was not that a very risky thing to do, to order the equipment before you knew the problem?" Well, in meeting military emergencies we are always faced with that situation, and our military units in the Corps of Engineers are equipped when they move into the field, and they have to do the work with what equipment they take with them. We try to provide those military units with a good standard, versatile type of equipment which will meet most emergencies. We were doing no more than that in this instance.

Mr. RILEY. Mr. Porter, do you agree in general with that statement?

Mr. PORTER. Yes. I think we were all drilled by the corps of the situation, and in turn to our men on the job, that the primary thing was that we had to get the work done very rapidly and had to adjust the situation to the materials that were available.

NECESSITY FOR USING PIT-RUN GRAVEL

Mr. RILEY. There was one decision made here, the decision to use pit-run gravel instead of going 18 miles, I believe, and getting into the rock quarry. Are you still of the opinion, Mr. Porter, that that was a wise decision, taking into consideration the equipment you had, both for crushing the rock, for transporting it, and the means of transportation?

Mr. PORTER. Yes: it was absolutely necessary to get the job done by the date line. It would have been entirely impossible to have built 18 miles of haul road, set up quarry and crushing plants, first, in the time limit; and, secondly, we would not have had enough crushing equipment to produce the material and enough hauling equipment, either rail or trucks, to transport it to the air base before the date line set for the emergency work.

Mr. PHILIPPE. There is a little more involved than just the 18 miles. It is up on top of a mountain, a perilous road, which even now is pretty scary to drive up. So, it is not just a simple 18 miles.

Mr. RILEY. I am glad to have that information.

Mr. BISHOP. I concur.

ADDITIONAL COST IF ROCK QUARRY HAD BEEN USED

Mr. RILEY. Was there any estimate made as to the additional cost should you have decided to use that rock quarry?

General HARDIN. Yes.

Mr. RILEY. What would the additional costs have run?

General HARDIN. In excess of $2,000,000. That would have been the additional expenditure in order to obtain the required materials

from the quarry rather than from the gravel pit, had it been feasible to do so.

Mr. RILEY. I understand—"had it been feasible."

I had a rough estimate given me from a private source that it would cost probably $3,500,000 to $3,750,000.

General HARDIN. Of course, we say "in excess of $2,000,000" because it is difficult to say exactly what it would have been. In all probability it would have been between the $2,000,000 and $3,000,000 range.

Mr. RILEY. The reason that I interjected that at this point is this: It occurred to me and the other members of the committee that it would have cost more to have used the rock quarry, with the subsequent loss in the time element, than the repair work on your highest estimate on the two bases, as testified here yesterday.

General HARDIN. Yes.

Mr. RILEY. You may proceed, General Hardin.

General HARDIN. The general specifications for the base rock at Nouasseur were received from the architect-engineer and distributed according to the information I have here on May 30, and on the 31st of May those specifications were supplemented by specification called special provision specifications, dated May 31, to satisfy the specific requirements of Sidi Slimane. So that is the history that can be reconstructed from the records of the proper figures under these specifications.

After those specifications had been approved and made available to the field forces there were some additional modifications, but none of any consequence that I can see.

PURPOSE AND USE OF ENGINEERING MANUAL

Mr. RILEY. General Hardin, I want to emphasize just one other point in connection with the engineering manual as published by the Chief of Engineer's office. Am I correct in my understanding that is a general manual for guidance which is adapted to the location where the work is being done?

General HARDIN. Yes. That is the theory. It has no specifications in it. It has the theory and it has the general policy. It has the formulas insofar as formulas are pertinent. It has the curves which an engineer uses as his tools, and it indicates the desirable limits for the designer to stay within in order to get an acceptable job.

Mr. RILEY. Is there anything extraordinary about the modification of these specifications to meet local and current conditions?

General HARDIN. Not at all.

Mr. RILEY. That has been the practice of the engineers for many years?

General HARDIN. Yes. They have to do it. There is nothing that is too regular in nature's materials, and that is the reason why we have to provide some envelope of definitions.

Mr. RILEY. Were the problems involved in Morocco more difficult and unusual than ordinarily encountered?

General HARDIN. Only in this respect, that it was not possible for the engineers to make a deliberate approach to the studies which are inherent in our normal procedures. The major problem there was that construction and design were practically a concurrent operation.

Mr. PHILIPPE. I think that it might be wise to add that in general the provisions of the engineering manual were followed in building up the designs and requirements in Morocco. The difficulties there were those of execution which again goes back to the equipment which is available to do the job, and there was no way at that time to overcome this difficulty.

DISCUSSION OF PRACTICE OF ADDING THICKNESS TO PAVEMENTS

Mr. RILEY. Mr. Porter, do you have anything to add to that?

Mr. PORTER. I concur in what Mr. Philippe said, and also in what he said a short time ago about the usual practice and procedures State-side. Where we have to use the material for a base course that is somewhat weaker than the best, but which is still acceptable State-side, we would modify our design and put on a thicker pavement, to start with. If we had started with the sequence of operations here that you follow State-side, we probably would have turned out a design for a 6½-inch thickness of pavement that we are now saying should go on there after we find out that we have partially constructed the field on the assumption of the highest strength base and then find out that is somewhat deficient. In other words, it is a standard engineering practice to thicken up the surface, as we have now recommended, to make a runway adequate at an economical cost which must take into account the use of local materials. So there is nothing unusual about it except this—that this all had to be done in a few months without the routine carefully planned study which is necessary to arrive at all these answers prior to construction.

Mr. RILEY. And without adequate equipment?

Mr. PORTER. Yes.

Mr. RILEY. This method of adding thickness to asphalt constructed roads is not unusual in State highway work, is it?

Mr. PORTER. No, sir.

Mr. RILEY. Sometimes they will put a thin layer on highways and use the highway for a year or two and come back and put another one on top of it?

Mr. PORTER. Yes. It is also not unusual to revise the design, and that is essentially what we are doing now to meet the conditions of the base course as available near the site. This is necessary because of the time element.

Mr. DONNELLY. I wonder if I might read to you a notation made by General Nold of a view that you expressed in January of 1952.

General Lovett recited instances of poor runway design and construction. In reply the architect-engineer pointed out the contractor was inadequately equipped with screens to produce the necessary gradation until recently, that in meeting completion dates paving was accepted which later would require either additional seal, or an additional layer of asphalt. In the architect-engineer's opinion, this would not cost substantially more than if corrective measures had been applied in the first place. Mr. Porter commented on his recommended design for one of the future runways which has poor foundation conditions. He pointed out that the rumor of excessive base thickness was exaggerated, that his design contemplated use of selected materials and build-up on the subgrade there to reduce the required thickness of the base rock in the pavement.

Does that accurately reflect the statements that you remember making at that time?

Mr. PORTER. Yes.

Mr. DONNELLY. This ties in with what was said just a few moments ago?

Mr. PORTER. Yes. I might add that it will not cost any more to put on the additional thickness now, as long as the plant is there and we have the time to do it under a well-programed procedure. Certainly, it was a wise decision to put down a thin pavement, just enough to carry the planes, to get the work done on time and then add the additional thickness now.

Mr. DONNELLY. Was this alligator effect at Sidi Slimane, the depression on the apron at Nouasseur, even the wavy effect in the rolling which has occurred in the last few weeks, something that you did not expect from your standpoint, or were these the types of things that you anticipated?

Mr. PORTER. It was the type of action which we anticipated, and in our opinion the only sensible approach is to strengthen the pavement. In a sense this is just a change in the design concept. In any event, it would have been done to start with, had we had the time to find out that either 6 or 6½ inches of the pavement rather than 4 or 4½ inches would have been necessary.

Mr. DONNELLY. It is more or less economical to apply the additional coats, layers, take the corrective action which appears necessary while the plant is there set up than at some later time when the plant is not there but has been moved away?

Mr. PORTER. Yes. It is very desirable to complete the construction originally contemplated at this time and also to put on enough pavement to make the runways adequate with the base that was used and to get the work done with the equipment available and while there is sufficient time. I do not think the question is important whether it costs slightly more or slightly less. The conditions on the job were such that it had to be done that way even though the cost of the work was greater. It was necessary to do it to meet the time limit.

EXAGGERATION OF CONDITIONS AT AIR BASES

Mr. DONNELLY. Mr. Porter, now that these conditions which you say you anticipated have materialized and have come to light and have been made the subject to discussion and criticism here in this country, would you care to express an opinion as to whether you feel there should be criticism because of the materialization of these conditions?

Mr. PORTER. I would not hesitate to say that the criticisms have been greatly exaggerated, particularly what you see in the press. I cite specifically talk about planes falling through the pavement. No such thing as that has happened, or will happen at Sidi Slimane. Slight depressions over small duct lines are expressed as though they are a failure. It is a minor settlement over a local area which is a problem of compaction. A slight patch over a very limited trench area is needed. This is just routine with an engineer. I think that there are numerous other examples of exaggeration, one specifically on the operations' apron at Nouasseur. It was expected when we put the heavy roller on that it would break through in a few spots. Such a practice occurs commonly on a highway. Even after putting in the base it is the usual practice to put on loaded trucks, or heavy rollers,

to find the soft spots before you finish up the pavement, so the fact that the roller dropped through in a few places does not mean that the planes are going to drop through. The fact that you tested it with a heavy roller first eliminated that possibility.

Mr. RILEY. Mr. Porter, are you familiar with the Pennsylvania Turnpike?

Mr. PORTER. Yes.

Mr. RILEY. Is that considered good engineering construction?

Mr. PORTER. I could go into quite a discussion. Turnpikes are progressing all the time. On each job we try to do a little better than on the last one.

Mr. RILEY. At the time that it was constructed it was considered quite a successful engineering operation, was it not?

Mr. PORTER. Yes. All of those jobs have been looked upon as excellent over-all.

Mr. RILEY. I note in traveling back and forth that they have some failures there and have to do a little dental work from time to time, so even in the best of operations in this country it is not unusual, is it?

Mr. PORTER. That is correct.

QUALITY OF CORRECTIVE JOB UNDER SUBMITTED ESTIMATE

Mr. DAVIS. Mr. Porter, I should like to ask you a few more questions on this matter of specifications, in a general way. Is it correct to state from your previous testimony that this $1 million or $2 million corrective job will result in what you would refer to as a top-notch paving job on these two airfields?

Mr. PORTER. Yes, sir. I think we are planning the reconstruction to remove any weak spots and to put on a first-class pavement after it has been thoroughly pretested and compacted by heavy rolling.

Mr. DAVIS. When that job is done then you would be proud to have had a part in laying a pavement of that kind anywhere in the world?

Mr. PORTER. I think under the whole job conditions we are proud of the job now.

Mr. DAVIS. That is what I am getting at. I am trying to find out whether you in your thinking are excusing the quality of the work because of the difficult conditions under which it was done.

Mr. PORTER. I thought in the testimony we made it clear yesterday that we were all satisfied on the approach being taken and that it would produce an A-1 job. Your question is so broad that I cannot help but refer to the fact that the costs would have been much greater with no improvement in the over-all facility had we been forced to build on a clay flat, where the French wanted us to build, or to build on some of the other sites. We have ended up with a job that is a good job that cost the Government at least $5 million to $8 million less than some of the alternate sites that were being forced upon us by various job conditions. By the various job conditions I mean that every site had to be approved by the Corps of Engineers, the Air Force, and the French, and many of the sites that we would select if we had a free hand could not be obtained because the French did not want the field there, or they could not get the land, or often there were graveyards somewhere within the area, or numerous other things.

But in the selection of Sidi Slimane we were able to get what you would say is one of the best sites we have anywhere in the country,

with a small amount of grading, a good sand subgrade that did not require a very thick pavement and base course, and the aggregates that were available were suitable for base with the proper thickness of top or pavement.

We should recognize that the costs are not too excessive, as there is still money remaining in the original allocation, all because a good site was selected that could be built on time even though it is necessary to add some additional thickness to the pavement now.

Mr. DAVIS. You are not concerned, then, about this testimony we had yesterday with respect to the rolling test there at Sidi Slimane during August?

Mr. PORTER. No. I expected that the rutting would be even more extensive than what I saw on the first 4,000 feet.

Mr. DAVIS. With this 1½ to 2 inches additional layer, as contemplated, it will completely rectify that situation and leave a top-notch usable pavement at Sidi Slimane?

Mr. PORTER. I think I have answered that quite completely in the written report, which includes the reservation that it might be necessary to put on another inch or two in some areas. But in the end the proposed program should furnish a good and a very economical job.

Mr. DAVIS. I should like to switch over now from the general specifications. I do not know whether you would call them specific specifications, but what I refer to is where you decided you had to change your conception with respect to aggregates and things of that kind. I gathered you had to improve to some extent on specifications from day to day, depending upon the materials and equipment you had available; is that correct?

Mr. PORTER. Yes. That was necessary to get the job done on time. That is why we are proposing some corrective treatment at this time, to take care of the deficiencies which developed.

Mr. DAVIS. I believe that is all.

Mr. DONNELLY. It is the feeling of the committee at this point that the major factors and considerations which affected this job have been incorporated in the record, and that the record is not a fragmentary record but, as we sit here now, it is a complete record, with everyone being accorded the opportunity not only to be heard, but in advance of the hearing to know the scope and subject matter of the issues, and to prepare whatever views and statements that each party or agency desires to express.

DISCUSSION OF LETTER OF GENERAL LOVETT TO GENERAL PICK ON INSPECTION OF MOROCCAN AIR BASE CONSTRUCTION

To close the hearing, the committee feels that the letter which General Lovett wrote December 27, 1951, to General Pick, which has been quoted in part in a document released to the public and commented on in the press should be placed before everyone here now, and such explanations as anyone desires to make be made at this time. (The letter referred to had been included in the record on p. 114.)

The record shows that that letter was distributed to everybody the night before last. General Pick, would you care to give us the background of that letter and your own comments on it?

General PICK. Mr. Chairman, I would be very glad to have the opportunity to do that.

This letter referred to is a personal letter from Gen. R. G. Lovett, division engineer of the East Ocean Division with offices at Richmond, Va. This division was set up about the 1st of November 1951.

Shortly after that time I had a meeting of my division engineers in Washington. During the course of that meeting I asked the division engineers as a routine matter if they would write me a letter once a month to tell me of any problems which they would like to bring to my personal attention, which were of a personnel nature or of an organizational nature or dealing with any of the work, with particular attention to things that they were handling themselves. I have done this from time to time in every assignment I have ever had in the Army.

Shortly after setting up this division and as soon as we could get it organized, I asked General Lovett to make a trip to North Africa to look over that particular job which at that time would come under his jurisdiction. I sent him there because of the many reports and rumors I was getting over there, and since he was going to be in charge of the work I thought he should get first-hand information of it as soon as possible. So he went over there just as soon as he possibly could and he came back and he wrote me this letter.

As the committee knows, it is a general letter; it covers many things about the jobs over there. In the letter he has called to my attention many things which I already knew and many of the rumors that I had already heard.

I accepted the letter on its face value as a personal letter to me, and I took such action as I thought the letter warranted, but I had the feeling that with the short time that he was there and going around very hurriedly, that he had been disturbed by all the rumors and was perhaps more affected by the rumors that he heard on the ground down there, with such a bad name for the job and the organizations engaged in the work over there, that I thought he was overimpressed with these rumors, rumors which I knew about before he went over there. Also, he has that particular characteristic of being very much in earnest about any work which he has, and in the letter there are indications that he wanted some help from me. He tried to impress it upon me in a personal letter to do everything I could to help him.

I received the letter as a personal letter, and I followed up on the main thesis that he brought out in there and I took definite official action on it as a result of that letter. He used some expressions in there that I did not think he would ordinarily use in describing the work, or in official correspondence. For instance, he used some descriptive adjectives there, old Army expressions. One of them is "sloppy." That was used very loosely in the letter.

That is about all I have to say about it.

Mr. Chairman, General Nold reminds me that I should complete that statement a little bit. After I received this letter I called in the people in my office and I directed immediately a meeting of the chief executives of the contractors' organizations which had joined up and formed Atlas Constructors, and I had a meeting in my office with the architect-engineers. One of the main points that General Lovett had made in here with respect to the PUSOM organization's work was with respect to overdesign. When I had the meeting in the office

Mr. Porter told me that he had heard the rumor, too, that there was overdesigning of the work over there, but that that was not the fact.

In addition to that, I sent some people there. I sent Mr. Philippe there and I sent Mr. Pringle out of my office over there, to do what they could to help work out some of these engineering problems.

I do not know how the letter got into the record of the hearings. I think that is all I care to say about the letter.

Remarks of Atlas Constructors on Lovett Letter

Mr. Donnelly. Does Atlas Constructors care to make any comment on the letter?

Mr. Bonny. Yes; we would like to comment on it, Mr. Chairman.

Mr. Donnelly. Or to make any comment on any other discussion. This is in the nature of closing. Anything else which you would like to add is pertinent now.

Mr. Bonny. Thank you. I would like to take about 5 minutes.

Referring to General Lovett's letter, which was handed to us by this committee the night before last, Mr. Mills of Atlas and myself had a meeting with General Lovett in Richmond. I do not have the exact date before me, as to whether it was before or after the writing of this letter, but it was approximately at the time that General Lovett wrote this letter to General Pick. It was prior to the time—shortly after January 1—that General Pick called the principals of our organization in for a conference with himself and others in Washington.

General Lovett had been over on the job, as General Pick states, at his request, and he referred to various phases in connection with the work, particularly the administrative phases, in almost the same language that he addressed General Pick in his letter. Mr. Mills and myself undertook at that time to tell General Lovett that we were quite sure that while we freely admitted that there were a good many phases and a good many circumstances in connection with the job that we were very unhappy with and were taking all possible means to correct, that we did not think that his attitude was justifiable.

As a matter of fact, I had met General Nold over on the job early in November. General Nold had gone over there representing General Pick—I do not know whether he mentioned this or not—for the purpose of assisting in running down the circumstances and situations which we all felt were not satisfactory.

Early in October our own organization had arranged for and had maintained two members of the operating committee of Atlas over there on the job. There were two members of the operating committee of Atlas, plus frequent trips of Mr. Mills and myself on that job until January, at which time Mr. Wilbur, a vice president and director of Morris-Knudson Co., was sent over as a nonreimbursable resident partner, where he is at the present time.

Problems of Cost Controls and Property Accountability

The problems arising and leading, in my opinion, to a great deal of the unfavorable publicity and the unfavorable comment in connection with the job were, as we have testified previously, the book work or the property accountability up until after the first of the

year, when it was possible to get it on a current basis. We are still keeping the best history on that, and it was practically impossible to keep it up to date and it was, I would say, sloppy. We found ourselves in a situation in the spring of 1951 where the French had refused permission to bring in sufficient people to Morocco to receive more than $23 million worth of equipment which landed on that beach, and all we could do was to take the best security provisions that we could take to protect it from thievery. We simply did not have and were not allowed to bring in sufficient people to keep proper and adequate book records, to keep track of the situation regarding the property, and it was necessary to use this property to construct those bases under the crash program.

The first authority to bring in more prior to the construction but after the receipt of some $23 million worth of equipment was approximately April 16 or 17. Excuse me; April 14 is the date. That was 8 days before the entire program was cut loose for construction and we had to be operating with equipment.

Prior to that time we had 160 people in Morocco, of which 12 were administrative people, and the balance were mechanics and operators for the purpose of actually moving this equipment out to an area where it was possible to use it when we were cut loose and allowed to do so.

A little more than 30 days later we had nearly 12,000 people on the payroll, of which nearly 3,000 were Americans. Those people had had to be gathered up by whatever means we could, shipped into New York, processed and passports secured, and shipped over. It would have been inconceivable to suppose that every one of those people was the most efficient and most skillful it was possible to find had you been given opportunity to do so.

We robbed our own organizations very liberally. Mr. Mills and others of the partners had people there, and so did our company, on the payrolls of the individual companies, for 30 and 60 and 90 days, and sent those people over immediately when they were cleared. But in the final analysis all that was a drop in the bucket.

As a result of that, while we got physical performance and we built the two bases, which were the only ones that were turned over to us for construction—we made them flyable, I believe, in record time—the records for property accountability purposes were inadequate and were inadequate for months. They became the subject of criticism. That matter was a matter of deep concern to the principals of Atlas. We were aware of the situation as early as July, and we made every possible effort to straighten the thing out. The top people that we sent over in administrative positions and people who had had previous long experience in our organization with problems of that kind had never come up with exactly the kind of problem they had encountered in Morocco.

This committee has heard the complications that surround both the construction phases and the engineering and administrative phases of this job. We feel that the United States Government has received fair value for the money that it has spent over there. We feel that the progress of the work is as good as it could be expected, and we do not feel that there has been any fraud or any material waste that could have been avoided by prudent business methods, or that would not

have existed had the entire matter been on a lump-sum basis and our own money had been invested in it.

I would like to mention one thing that may be of interest to the committee at this moment because of the figures of expense that have been bandied around. The figures I have are current.

AUTHORIZATIONS, OBLIGATIONS, AND EXPENDITURES

As of the 15th of September, we have $201 million authorized specifically for Atlas Constructors. We have actually expended $173 million. We have additional commitments for advance purchases in the amount of approximately $20 million. In this expenditure is included an amount of $27 million for equipment and plant, which will completely build the entire job and is distributable over the entire job and not properly chargeable to the $173 million that has been spent.

In addition we have materials on hand in inventory which will be used in the construction of the job in the amount of approximately $15 million.

We do not believe that the final cost of these five bases, if the two remaining bases are released in a reasonable time, is going to exceed the original estimated cost by any amount which even is comparable to the increased cost of construction in the United States since this contract has been awarded.

Now, I want to add just one thing to that. For Atlas, I wish to express our appreciation of the extremely thorough, and extremely fair, manner in which this committee had conducted this hearing. We want to say we feel we have had a very fair, patient hearing. We have had full opportunity before this committee to state all of the facts as we know them. We can't say the hearings were a pleasure, but we do want to say it has been a privilege to appear before this committee, and we feel it is functioning in the manner congressional committees are supposed to function, as representatives of the taxpayers, for the purpose of determining whether proper expenditures are being made of the taxpayers' money.

Thank you very much.

Mr. RILEY. Thank you, sir.

EFFECT OF CRASH PROGRAM ON MORALE OF PERSONNEL

Mr. DONNELLY. Mr. Bonny, one element or factor has been eliminated by many who have studied the Moroccan job, and that is the effect on the human being of continued exertion under a 70- or 80-hour week. I remember when Finland was invaded by Russia some years ago, the Finnish people attempted that, and their nerves broke in 3 or 4 months, notwithstanding their stamina and willingness to resist. Did Atlas have that experience in Morocco? Did people's spirits and health suffer by reason of the long hours they worked?

Mr. BONNY. Very definitely, Mr. Donnelly. We had a number of people who, to use the expression, "blew up" during the period from August to September, October, and November. We had to release and transfer out a number of the top people who could not stand the physical and mental strain. Some of those people who had to be moved out of there are employed by our company in a similar capacity today and are successfully operating.

The pressure under which that job was operated was a terrific strain. It was a strain on everybody concerned. There is no question about that. The resulting fact was that in the lower echelons it led to

some drunkenness, relaxation, cutting loose when they did get off on an occasional Sunday. In the higher echelons, a few of them blew their tops and a few dragged on through.

I think that situation would have corrected itself, because as soon as the urgent features of the program were completed, the working hours were cut down, and I think the morale improved very greatly during November and December.

Frankly, the unfavorable publicity and severe criticism of the job and everyone connected with it has very severely injured morale so far as the operations this year are concerned. Fortunately, the weaker members are leaving, and those that became disgruntled, and because of the slowing down of the program the matter is not serious at this time, and we hope and believe that if we get work allocated to us, we could finish the program to the credit of everybody concerned.

RELATIONSHIPS AMONG CORPS OF ENGINEERS, PUSOM AND ATLAS

I want to add this one thing: There were accusations brought by various individuals, and there were statements made, as to lack of cooperation, lack of coordination, and hard feelings as between the people in the Corps of Engineers, PUSOM, and the Atlas people.

I believe I went on record in the previous testimony before this committee to say that I did not believe that the relations, top-side, between the Corps and PUSOM and Atlas were bad at all. I think I stated that in the lower echelons there was the same type of disagreement and bickering that very normally occurs between different functions and the different parties to a major contract.

I want to say that I believe the Corps of Engineers and PUSOM, through a very difficult and trying period, have made extraordinary efforts to make it possible to continue this work efficiently, and to improve morale and improve relations between the three agencies.

As far as Atlas is concerned, we are certainly not proud of the publicity or notoriety that has come out of this, but we are proud to be working with the Corps of Engineers and PUSOM on this job, and hope to complete it to the credit of all concerned.

Mr. DONNELLY. The Atlas organization, top level, has been criticized publicly because of alleged weaknesses. There was a man named Dan Teeters on the job at the beginning, was there not?

Mr. BONNY. Yes, and he is still there.

Mr. DONNELLY. What is his position?

Mr. BONNY. Dan Teeters is the construction manager.

Mr. DONNELLY. I have heard that he was captured on Wake Island at the beginning of World War II and spent the duration of the war in a Japanese prisoner-of-war camp. Is that correct?

Mr. BONNY. That is correct.

Mr. DONNELLY. And since World War II terminated he has returned to heavy construction work, as I understand it?

Mr. BONNY. That is correct. He has been on construction work since the termination of World War II. Mr. Teeters worked for me as long ago as 1926. We were both pretty young in those days. And Mr. Teeters has been a construction superintendent and construction manager his entire life. He was project manager on Wake Island at the time he was captured. He suffered no physical or mental bad effects from it, and is physically and mentally in good condition today.

COMMENTS OF PUSOM ON LETTER OF GENERAL LOVETT

Mr. DONNELLY. Mr. Porter, do you, as representative of PUSOM, the architect-engineer, have any statements to make, general or otherwise, in the nature of closing this hearing?

Mr. PORTER. I would like to ask one question: Whether this personal letter from General Lovett is going to be a part of the record?

Mr. RILEY. It is already in the record.

Mr. PORTER. In view of that, I would like to say one or two words about the comments there, and in the light of the explanation which General Pick gave regarding this letter.

I wish to point out that this was a very difficult job, and we started studying the engineering aspects of it on January 21 with a small staff of people. We were able to get permission and authorization to get in a staff of 70 to 80 people during the months of February and March by pulling them from our organization—two offices on the west coast and our work on the Jersey Turnpike.

Authorization was withheld for ample people, brought about by a restriction of the French to start with, and it was not until April 15 or 16 in 1951 that we had authorization to spend more than $50,000. At that time the agreement between the two Governments was formulated and signed, so that we received additional authorization and a rush order to get a few hundred more people overseas to make the studies and prepare designs.

Every step of the study was made with two objectives in mind: First, to select sites in the preliminary study that could be built rapidly; and, secondly, at minimum cost.

I have a map showing some 87 sites over an area extending a few hundred miles along the coast of Morocco, which were all given study in attempting to select sites to replace the original sites that had been thrown out of the program.

To do that on an economical basis, and to make it feasible to construct a fully serviceable air base with both point 1, on time, and point 2, low cost, in mind, it was necessary to make rather extensive geological studies of many areas.

Detailed studies were made to determine the slope of the ground and select sites requiring minimum excavation; select sites where aggregate sources were available, where railroad facilities and road access were readily available; and to select the site where it would be feasible to develop water supplies to serve the bases.

In connection with this study of the 87 sites, many hundreds of miles of surveys were made in the short period of 2 or 3 months, with a very limited, but a top-flight qualified staff.

I might point out that economy was not only of first importance from the money standpoint, but also of primary importance from an energy and the on-time standpoint. At Ben Guerir, for example, some 40 square miles of the area were surveyed to determine where the runway should go so that it could be laid where the slope of the ground would conform to the design criteria and require only a small amount of earthwork. As a result of that study, the runway was located at a place where there was very little clay, which avoided the necessity of a thick base course, and it was also located at a point where the cuts and the excavations and fills are very, very minor—of the nature of a few feet. Other sites oftentimes, even those in the original plan, required cuts and fills 30 feet in depth.

Numerous other sites that had been proposed would have cost more time and much more money. Time was particularly costly in this whole rush program.

I am very pleased to make this statement on the first statement in General Lovett's letter and to learn that the survey made by the Corps of Engineers during he past 5 or 6 months of study has convinced them that this statement was a hurriedly made personal comment, and that our designs were not overly conservative.

In connection with the second sentence, I think that has been explained. There was a matter of engineering judgment of whether the apron—I think this example refers to the operation apron at Nouasseur—should be built higher with fill and ample slope or should be lower to reduce earth work and using some other provisions to accomplish drainage. Part of the trouble which developed would have been avoided by our original design.

Referring to the last paragraph of the letter, I believe the corps has since been satisfied that we were attempting to do an economical job of design with the soils and conditions available on the site. Selected soils have been located over a considerable area by a thorough study involving many hundreds of test pits. By placing selected soil over the heavy clay soil on this project, the cost will be nominal.

So much for that letter of General Lovett's.

I would also like to say that we appreciate the opportunity to appear here. We had been invited before, as Mr. Donnelly mentioned, but at the time we felt that the matter had been so thoroughly investigated that our comments would not warrant extending the investition. We felt that the job was going along well, and, after all, the job of an architect-engineer and a contractor is to get the work done.

We appreciate greatly the very fine attitude of the committee, and the way in which they have gone into this investigation, conducting it in a way so as to give us a very good opportunity to express our thoughts in such words as we are able to command at the moment.

I also want to say, before closing, that I have worked with the Corps of Engineers extensively, both on research work and on construction, for some 12 or 13 years, and I have a very, very high regard for the personnel of the Corps of Engineers.

I also wish to second Mr. Philippe's statement about Dr. Buchanan, who advised the Air Force. He is a very good engineer. I am sure if he had been sitting here with us, with his feet under the same table, there probably would not be the disagreements which seemed apparent for a short time yesterday.

I also wish to add that I worked with Atlas Constructors, and particularly with Morrison-Knudsen, some 25 or 30 years, designing airfields, roads, and dams on which they have been contractors. I know they have top people. And, furthermore, I can assure you there are no hard feelings between us, in the architect-engineer profession, and Atlas Constructors. We can continue to work on a cooperative basis, and with the weekly conferences that are being held on the job under General Walsh's and Colonel Campbell's direction, any minor points that come up from day to day are worked out readily and without difficulty, all to the best interests of the Government.

Thank you.

Mr. RILEY. Thank you, sir.

Mr. DONNELLY. Mr. Perry, as the representative of the Air Force, you have heard the testimony the last 3 days, and I believe you have had opportunity to examine the previous testimony; in closing this record, is there any statement you wish to make, or that the Air Force wishes to make?

Mr. PERRY. I haven't thought about it. I believe it is correct to say that I was greatly pleased at the way the hearing was conducted. I talked with Mr. Huggins last night, and he felt very well pleased with the way you conducted your hearings. I think that is all I want to say.

COMMENTS OF GENERAL PICK ON CONDUCT OF HEARING

Mr. DONNELLY. That brings us to the Corps of Engineers. Does the corps desire to make any further statement?

General PICK. Mr. Chairman, speaking for the Corps of Engineers, our organization here in Washington and our organization in North Africa, I want to express our very deep appreciation for the sincere and forthright manner in which your committee has gone into this very complicated problem.

I want to express our very deep appreciation for the courteous treatment that you have given me and members of our organization, the Corps of Engineers, in all of your dealings. I want to express to you, Mr. Chairman, the feeling of our entire organization here in Washington that your staff, personnel, headed up by Mr. Donnelly, has been very helpful to us in every way possible in preparing our statements and our appearances before the committee. I know that there have been times when we have not been able to furnish him the information which he has asked for. We have not been able to do it as rapidly, possibly, as we should have. But I can assure you, sir, that we have made an earnest effort to comply.

There is just one thing that I would like to say, that I should have said, about morale. I agree in general with everything that Mr. Bonny had to say about morale, and Mr. Porter. I would like to give you my feelings and my observations in the matter of morale.

Everybody knows that the morale of the organization of the Corps of Engineers, of the contractors, and of the architect-engineer, not only connected with these jobs but throughout the entire industry, has been affected. On my last trip to North Africa, after we had worked a week to try to work out a program for remedial action, I had occasion to meet with a considerable number of the top people in the Atlas organization, the PUSOM organization, and the Corps of Engineers organization at Nouasseur. When the information was out that a program had been agreed upon, there was a noticeable change in the morale of all of those people concerned. It was very noticeable that now we had arrived at a point where we could find a solution to the troubles in north Africa. It had lifted a load, apparently, from their shoulders. I think the morale is better now than at any time since the work was so thoroughly advertised.

I believe that the job is going along splendidly now, and as a result of these last 3 days' hearings, this information that will be taken back to the job by all of us present here will go a long ways toward stimulating morale, not only over in north Africa, but in our organizations here in the United States.

Mr. Chairman, there is one other thing I would like to add, and that is that I still have confidence in the contracting organizations which have been joined together to form the Atlas contracting firm. Those gentlemen, those contracting firms, were firms with national reputations when they were put together. I believe they are capable and qualified now, and I feel sure that they are going to complete this job. I think that Mr. Porter and his PUSOM organization are competent, and I have not lost confidence in either the architect-engineers or the contractors. I think that they will see these jobs all completed over there, and will turn in a commendable performance.

Mr. RILEY. Thank you.

CLOSING STATEMENT

Gentlemen, as has been expressed here many times before, this committee has attempted to go into these hearings in an objective manner. It has reserved its opinion until all the testimony has been presented, and it has come to no conclusions until it has had an opportunity to review that testimony and to have the full information which has been presented over the period.

The Appropriations Committee of the House of Representatives, as you know, initiates all appropriations, and, of necessity, due to the character of its work, it has to have more detailed information, and certainly as much detailed information, as any other group. It has to have this information in order to properly evaluate the requests for funds that are made of it, and to decide whether or not those funds have been properly expended. It is our obligation to see to it that the taxpayers at least get a reasonable result for the money which is expended.

We appreciate very much the testimony of the witnesses that have appeared before us. We realize fully that it has taken effort on your part, personal sacrifice in some instances, actual hardship in others, for you to be here.

Naturally, in a matter of this magnitude, there are bound to be differences of opinion, and I don't know but what that is a healthy situation; but as reasonable men we can always reconcile those differences for the common good, and I believe that perhaps this committee has had some hand in reconciling some differences; at least I hope so.

We believe that as a result of the hearings we have had we now have adequate information to furnish the Congress and the American people with a full and factual report of this undertaking.

I want to express to you again both my personal appreciation and the appreciation of the committee for your testimony, your frankness, your courtesy.

Mr. Donnelly.

Mr. DONNELLY. These hearings on Morocco have extended over a period of many months. The record is extensive. As a representative of the committee, I do know that I have been accorded cooperation and assistance by everyone concerned.

It has been a most gratifying experience to have the opportunity to develop the Moroccan story, as has been done here, in the detail in which it has been developed. There is no doubt it will be beneficial, not only to Members of Congress, whose job it is to do this, but also

to the American people, who are interested in that tremendous undertaking.

Mr. RILEY. The committee will conclude the hearings and stand adjourned.

APPENDIX

(The following was requested on p. 103:)

COST ESTIMATES AND CONTRACTS FOR FRENCH MOROCCO

As the previous testimony before congressional committees discloses, great difficulty was experienced in developing a firm program for the work in Morocco. The work, both design and construction, was started under letter orders. However, on June 21, 1951, the USAF furnished the Chief of Engineers three programs:

(*a*) A program showing what should be done with the funds made available by the USAF at that time ($73,600,000).

(*b*) A program which purported to show the ultimate development program for the bases in Morocco (estimated cost: $354,871,300).

(*c*) The program of construction contained in the May 28, 1951, Air Force Budget Book (back-up for the fiscal year 1952 appropriation). This program carried an authorization of $296,960,800 [1] and appropriations totaling $252,269,800 [2] against the authorized program.

The so-called ultimate program dated April 26, 1951, had been presented directly to the district engineer by the USAF. Because of the terms of the agreement with the French Government, it was required that award be made to only one contractor for the construction work in Morocco. For that reason the contracts with the architect-engineer and the construction contractor provided for the design and construction of all facilities which it was then believed by the district engineer would be constructed in Morocco (that is the base development, programed at $354,871,300 and a Globecom station programed at $3,596,000 a total of $358,467,300 as detailed below).

Program used as basis of contractor negotiations

(April 26 program mentioned on p. 522 of hearings, pt. 4)

Base construction:	
Rabat sale	$6,899,300
Nouasseur	94,345,300
Mechra Bel Ksiri	23,246,900
Ben Guerir	72,580,600
Sidi Slimane	74,908,600
Louis Gentil	56,090,600
Area POL	26,800,000
Total	354,871,300
Globecom facility (a worldwide program)	3,596,000
Grand total	358,467,300

[1] To which must be added $3,596,000 for a Globecom facility separately authorized, rounding out to a total of $300 million for Morocco.

[2] In the summer of 1951 the Air Force administratively transferred $6 million to the Moroccan operation, making the total $258,269,800.

The prospective $358,467,300 was allocated at that time as follows:

Construction contract	$300,000,000
Fixed fee	5,350,710
AE contract	9,985,439
Fixed fee	657,000
Government costs; administrative and direct payments for materials and services	42,474,151
Total	358,467,200

The award of CPFF contracts on the basis of the ultimate scope of the work did not in any way commit the Government to spend money which had not been authorized or appropriated by Congress. The CPFF contract covers the scope of the work to be done. It specifically states that the cost of the work is an estimate only and is not guaranteed by either the contractor or the Government. In order that available funds would not be overcommitted, the contract stated that only a portion of the funds were available and the contractor would proceed as directed by the contracting officer if it appeared that funds would be over-obligated.

Subsequent to the award of the definitive contracts, there have been numerous changes in the scope of the program as directed by USAF. The program is now essentially stabilized.

Because the contract provides that the Government at its option may furnish to the contractor any materials and services, it is impractical at this time, even though it were possible to make exact cost estimates, to predict what the payments will be to the construction contractor. There is attached, however, an estimate as of August 31, 1952, of the obligations made by the contractors and the Government.

Estimated obligations[1] *as of Aug. 31, 1952*

By Atlas	$201,000,000
By PUSOM	11,750,000
By French	7,700,000
By Government direct:[2]	
Transportation	10,600,000
Construction materials and supplies	5,500,000
Administration and supervision	4,500,000
Total	20,600,000
Grand total	241,050,000

[1] These obligations cover firm commitments by the contractors which will result in payments to them.

[2] This breakdown of Government obligations was estimated by OCE on the basis of the best information available. Obligations for transportation, construction materials and supplies are properly chargeable to construction.

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